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### RHEUMATOID ARTHRITIS.<sup>1</sup>

By SELWYN NELSON,  
Sydney.

WORLD-WIDE interest has been aroused in the therapy of rheumatoid arthritis since the demonstration by Hensch and his co-workers (1949) of the effect of cortisone and ACTH. The limitations of these agents in producing lasting benefit are now well understood. The speed with which remission is induced sets a standard for the assessment of all therapeutic agents. The relapses which follow suspension of treatment with these hormones serve to indicate that the ideal form of therapy has yet to be discovered.

In a discussion of the present status of therapy in rheumatoid arthritis, it is necessary first to review the natural history of the disease, for it is only with a clear concept of its protean manifestations that proper ideas about treatment may be formed. Rheumatoid arthritis is a systemic disease of unknown cause which affects both sexes and all age groups. In the cases in my own experience the earliest age of onset was four years, and the latest eighty-six years. The more florid manifestations of the disease are seen in children and young women, so that those whose experience is gained in the wards of public hospitals may well form the impression that it is a disease of young women, while experience in general practice or in the out-patient department will be among the less florid cases in the middle-aged group of the community. One

feature which creates great difficulties both in the planning and also in the assessment of results of treatment is the great variability in the clinical course of the disease. This variability involves every aspect—the mode of onset, the degree and permanence of joint damage, the sites of maximal involvement and the degree of the systemic reaction. Added to this there is a variability in the duration of the active phase and in some cases a tendency to temporary remission followed by further activity. The difficulties which beset the clinician seeking to evaluate any form of therapy are great. Unless the results are so striking as to admit no doubt as to causal relationship, only a large series of cases with proper statistical control will eliminate the possibility of error due to spontaneous remission.

One other factor must be considered by the clinician. This is the type of person afflicted. The age, sex, occupation, financial status, educational standard, intelligence and personality of the patient will have a profound bearing on the plan of treatment and on the ultimate rehabilitation. The reaction of the patient to his disease may create great problems in minor cases, or may be the factor which makes possible a good result after many months of tedious treatment.

#### Division into Types.

When a diagnosis of rheumatoid arthritis has been made and with a full consciousness of the variations mentioned, it is necessary to attempt to place the patient in a category which will assist the clinician in formulating a plan of treatment. The important features are the degree of activity, the presence and degree of joint damage and the degree of constitutional reaction. The categories are as follows:

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on August 30, 1951.

1. Early active cases, (a) mild, (b) moderately severe, (c) severe.
2. Late active cases, (a) with mild joint damage, (b) with severe joint damage.
3. Inactive cases, (a) with slight joint damage, (b) with extensive joint damage.

In none of the early active cases should irreversible joint damage have occurred. The subdivisions indicating severity will be made partly on the degree of anaemia, the presence of fever and wasting and the elevation of the blood sedimentation rate, partly on the distribution and extent of the joint lesions.

In the later cases some degree of irreversible joint damage may already have occurred, such as destruction of bone and cartilage, loss of mobility and actual subluxation. The disease is still at this stage active and progressive, showing the same signs of activity as the early group.

The third category includes the burnt-out cases which by now have reached quiescence, with a normal blood picture and little or no pain, but with the crippling deformities which incapacitate the patient to a greater or lesser degree for life. One of the main problems of treatment is to enable the patient to pass from the first to the third category with little or no deformity. This becomes increasingly difficult in cases in which the severity of the rheumatoid process is great.

#### The Aims of Treatment.

In the absence of a cure for rheumatoid arthritis, the objectives of treatment must be realistically assessed as follows: (i) Treatment designed to hasten the remission. (ii) Treatment designed to protect the joints from damage, (a) physical, (b) chemical. (iii) Symptomatic treatment of (a) pain, (b) anaemia, (c) sleeplessness, (d) muscle spasm, (e) nutritional disturbance. (iv) Specific anti-rheumatic treatment, if possible. (v) Treatment designed to improve muscle and joint function. (vi) Corrective treatment for deformities. (vii) Psychotherapy (including occupational therapy).

The patient in the early active stage with minimal joint involvement may well be allowed to continue at work. Aspirin with codeine combines the symptomatic effect of relief of pain with the probable role of "anti-rheumatic" remedy. Iron in the form of ferrous sulphate in three-grain to five-grain doses three times daily helps to treat the anaemia which is usually present, although the persistence of anaemia in spite of adequate doses of iron until the phase of remission supervenes raises doubts as to the role of iron deficiency in this disease. Special measures, such as splinting of the joints, supervised physiotherapy and heat treatment are rarely necessary in this form of rheumatoid arthritis. Gold treatment is of assistance in shortening the active phase; improvement usually begins after the fifth or sixth injection, but a total of one gramme of gold salt should be administered, with further injections after a brief interval if relapses are to be prevented. Psychotherapy in these cases resolves itself into reassurance of the patient as to the mildness of the disease and the confident expectation of a good result without incapacity. However, these patients should be kept under observation for several years, as they may relapse and show more extensive joint lesions at any time.

The patient in the early active phase with severe constitutional reaction and extensive joint involvement needs hospital treatment. At this stage no irreversible joint damage will have occurred, but all the therapeutic resources available to the clinician will be needed if this is to be prevented. The active cooperation of the orthopaedic surgeon and the physiotherapist will ensure that joint position and mobility and muscle power are retained while deformities are prevented. With their help also pain will be minimized. What is done is a compromise between complete rest in a splint, which is comfortable for the patient, and exercise, which is painful but which keeps the joint mobile and the muscles in a useful state of development. The balance between these two objectives

depends on the activity of the joint lesion and calls for nice judgement on the part of the clinician. Concurrently the medical treatment includes bed rest, good food, sedatives and hypnotics. Chrysotherapy for these patients may well shorten the duration of the acute and active phase. If the anaemia is severe blood transfusion is more rapid and effective than the administration of iron by mouth. I have found that the haemoglobin value tends to fall gradually after blood transfusion in spite of oral iron therapy, so that repeated transfusions may be necessary. The experience of Simpson, Kersley and Hall Brooks (1949), in a controlled series of 50 patients treated by blood transfusion and infusion of packed cells and blood plasma, indicated that a rapid subjective improvement occurred after transfusion which had little effect on the polyarthritis but which was a useful supportive measure.

If cortisone or ACTH was freely available, use could be made of the protective action to screen the joints from damage. At the present time, however, the necessity of prolonged administration during the phase of activity, which these substances do nothing to shorten, makes this form of treatment unwise. It seems wrong to afford the patient a brief glimpse of comfort which must inevitably be followed by a relapse when scarcity precludes the further administration of the drug. This view may be modified if experiments at present being conducted with the concurrent administration of cortisone and other treatment, such as gold, show the active phase to be appreciably shortened while joint protection is given with the hormone.

The use of insulin hypoglycaemia may assist the patient in two ways: appetite and weight are increased, and in some cases there is improvement in the joint condition. In general these patients run a tedious course with the gradual subsidence of the rheumatoid activity.

These patients need reassurance that the ultimate result will be satisfactory. They need further constant encouragement to cooperate actively in the programme of treatment which makes demands on their courage and endurance. It is not sufficient for them to lie passively waiting for a cure to be effected by their attendants. Special qualities of patience and cheerfulness are required of their attendants, both the doctors and the physiotherapists. The patient should be made to feel part of the team encompassing his recovery. The occupational therapist may at a suitable stage be brought into the picture. At first her contribution may be purely diversional; later specific movements and skills may be developed or improved by the encouragement of specially prescribed projects.

At a suitable stage of treatment, when the acute changes in the joints have settled down, the patient is allowed up. It must be emphasized that it is not necessary to wait until the sedimentation rate is normal before the patient is allowed out of bed. Reasonable freedom from fever, and more important, absence of severely painful feet, ankles and knees are all that are required. The patient should wear proper shoes, not slippers. The advice of the orthopaedic surgeon concerning special shoes, metatarsal bars or other aids may be of value in some cases. Patients at this stage may not have much stamina, and the period out of bed should not be unduly prolonged at first. If the physiotherapist has encouraged exercises for the muscles of the back while the patient was still in bed, there will be more rapid progress in walking when the patient is up.

The treatment in the moderately severe early active case follows the same principles as that of the severe type, but may not require hospital treatment. Brief visits to hospital may allow blood transfusions, short courses of insulin hypoglycaemia, or active physiotherapy. These patients are often fatigued by the difficulties of travel to hospital out-patient clinics, but may be looked after at home under suitable conditions, provided that meticulous care is taken by the practitioner in the use of the proper principles of joint care. Their management makes many demands on the time of the busy practitioner, yet neglect may result in the development of deformities which, once present, may never be lost. Many of these patients may be allowed to perform light household tasks provided that undue fatigue

is avoided. The task of the practitioner often includes impressing on the relatives of the patient the need for redistribution of home duties among other members of the family, the making of arrangements for care of children and the orientation of ideas of the nature of the illness and its likely duration. Ideally, of course, there should be special rehabilitation centres where patients of this type could receive supervised care without too much of the hospital atmosphere. Such a centre would provide medical and orthopaedic treatment along with physiotherapy and occupational therapy, without the need for worry about the duration of the patient's stay which characterizes the use of beds in general hospitals.

Patients in the late active stage usually present with a combination of joint deformity and active rheumatoid arthritis. At this stage the problem is partly one of treatment of the active disease, partly one of reduction of the flexion deformities of the knees and the ulnar deviation of the fingers and wrists, and increase of the restricted range of shoulder movement—the commonest of the deformities seen at this stage. The active process is dealt with in the same manner as the early active process; the deformities require individually planned forms of therapy which usually comprise a combination of medical and orthopaedic measures. It is in these cases that the use of cortisone may allow manipulation and temporary immobilization of knee joints or the manipulation and subsequent active use of the shoulder joints which might well provoke active reactions with effusion and regression of status without its protective effect. Drugs which permit muscle relaxation, such as "Myanesin" and curare (tubocurarine in oil), will often assist in the overcoming of deformities.

In the inactive cases with slight joint damage little may be needed to restore function to the full extent. A careful appraisal of these patients may show some possibilities for improvement, such as restoration of better shoulder movement, or the use of modified footwear.

In the inactive cases with severe joint damage the problem is one of salvage. A twofold approach to the appraisal of these cases is necessary. The first is based on functional disability: Is the patient bedridden, chair-ridden or ambulatory? What can the patient do with the hands? (For example, wash, comb her hair, feed herself, dress herself, attend to toilet requirements, open doors, write, type, perform household duties.) Is the patient capable of working? If so, in the former occupation or in some less arduous one? The second approach is to determine, in detail the state of the muscles and joints which have sustained damage in the course of the disease. These two groups of data may then be considered in the light of knowledge of the age, intelligence, social status, educational standard and personality of the patient. Decisions may then be made to advise treatment designed to improve the status of the patient. While many of the problems involved require orthopaedic treatment, the physician has much to offer the patient. In particular, certain of the operations have a greater chance of success if cortisone or ACTH is used during certain phases of the post-operative treatment. This will enable such procedures as arthroplasty to be carried out without great risk of fibrosis and bony overgrowth. One illustrative case will emphasize this point.

W.B. developed Still's disease when a small girl, aged four years. When examined at the age of twenty-one years she was a chair-ridden invalid, with flexion deformity of knees and hips, restriction of movement of the shoulder to 30° of abduction, and complete bony ankylosis of both elbows in extension at 170°. Movements at the wrist were restricted, and there was no supination. The blood count and sedimentation rate were normal. In spite of her disability she could sing, play the piano and use the typewriter. She could not feed herself or do her hair, wash her face *et cetera*. She was anxious to live a normal life, and was willing to cooperate to the fullest extent in her rehabilitation. She had realized her disablement more acutely when her sister had married. Her muscular development was poor. She was examined in consultation by Dr. L. J. Woodland, who advised as an initial step arthroplasty of the right elbow after a preliminary stage of active exercises

designed to increase the muscular power of the biceps and triceps. This operation he successfully performed, obtaining a good range of movement with preservation of the muscular insertions. After the wound had healed, from the twenty-second to the thirtieth post-operative days she was given cortisone, 500 milligrammes during the first two days, then 100 milligrammes per day. Later the head of the ulna was excised and further cortisone given. She was discharged from hospital with a functionally useful elbow permitting her to feed herself, wash her face and comb her hair. Later it is proposed to carry out further operative treatment, with the use when necessary of the protection of cortisone to guard against the dangers of fibrous and bony overgrowth.

#### Recent Advances in Treatment.

It will be seen that much of the treatment advocated is a careful and well-considered application of well-established principles. There is at present no short cut to cure. Much of the progress in therapy is not as yet beyond the experimental stage. Most of this experimental work centres about the effect of the adrenal cortical steroids. Apart from attempts to stimulate the production of increased amounts of natural steroids, other compounds with closely related chemical structures have been tried.

#### Cortisone.

Patients suitable for cortisone administration are those whose disease is in the active phase. The cortisone administration should be part of a plan of treatment designed to achieve permanent gains in the patient's status. Patients in the late active stage with considerable irreversible joint damage must be carefully studied from the viewpoint of muscle condition, site and type of joint damage and morale. Consultation with an orthopaedic colleague is helpful in making the decision concerning procedures likely to "up-grade" the patient. The patient must further be studied to determine suitability for cortisone administration from the viewpoint of his general health. Pulmonary tuberculosis, active peptic ulceration and advanced renal disease are contraindications. Patients with an unstable personality are likely to develop psychotic trends under cortisone treatment. These range from exaggeration of the euphoria to hypomania. Any impairment of carbohydrate tolerance is likely to be aggravated by the cortisone.

The following tests may be considered the minimum investigation required before treatment is commenced: (i) A full blood count and estimation of the blood sedimentation rate. (ii) X-ray examination of the chest. (iii) Examination of the urine for sugar after a large carbohydrate meal. (iv) Clinical test of the urine (for specific gravity and albumin), with further renal function tests if the result is doubtful. (v) Investigation of the history for evidence of peptic ulcer, with an opaque meal if there is any suspicion of an ulcer. (vi) Electrocardiography (to get a reference tracing for subsequent check of potassium deficiency). These tests are, of course, additional to the skiagrams of selected joints to assist in the determination of joint changes.

**Dosage.**—The plan of dosage which is most commonly adopted is 100 milligrammes given by intramuscular injection three times on the first day and twice on the second day, and thereafter a single daily dose of 100 milligrammes. This is continued for a variable period depending on the patient's response. Careful watch should be kept for oedema (indicating sodium retention), weakness and irritability (indicating potassium loss), insomnia (possibly heralding psychotic changes), and excessive changes resembling Cushing's syndrome (although mild changes of this type are common and not dangerous). Regular blood counts and estimations of the blood sedimentation rate will augment the clinical observations of reduction of joint pain, swelling and stiffness.

**Adjuvant Therapy.**—Unless it is contraindicated by previous toxic reaction or renal impairment, gold therapy should be given concurrently with the cortisone. This should be continued after the cessation of treatment until a full course has been given (for example, a total of one

gramme of "Myocrisin"). Henderson *et alii* (1950) have suggested the use of insulin as a possible potentiator of cortisone, of 20 to 60 units in single or divided doses, with a daily dosage of cortisone of 12.5 to 50 milligrammes. Manipulation and other orthopaedic procedures may be undertaken under the "screen" of the cortisone therapy. Active muscle reeducation, faradism and exercises are advised during the cortisone regime. Occupational therapy may be prescribed to assist in the rehabilitation of the patient.

**Comment.**—The present shortage and high cost of cortisone render each patient's treatment a project which may not be prolonged indefinitely. There is no firm decision as yet whether it is better to give multiple short courses or one long course. Neither has any final decision been made as to the best way of concluding the treatment. It is realized that natural ACTH production is inhibited by the physiologically enormous doses of the synthetic hormone. If treatment is terminated abruptly, there is a period of relative adrenocortical inactivity in which relapse may occur, but normal adrenocortical activity is not permanently suppressed. One method of terminating the treatment is to give gradually diminishing doses of the hormone, 50 milligrammes per day for a few days, then 25 milligrammes per day until treatment is stopped. Some have tried the subcutaneous administration of adrenaline (0.5 millilitre of a 1:1000 solution) three times a day after this to stimulate the pituitary gland via the hypothalamus. Others have used small doses of ACTH. As cortisone does not influence the course of the disease, but merely suppresses its manifestations, relapse is common after the cessation of treatment.

#### ACTH (Anterior Pituitary Adreno-Cortico-Trophic Hormone).

In general the remarks about cortisone apply to ACTH. The cost is over £100 per gramme at present, more than five times the cost of cortisone. It must be given in divided doses three or four times a day. Sixty milligrammes are roughly equivalent to 100 milligrammes of cortisone. There are certain side reactions such as abdominal cramps due to impurities (posterior pituitary extract). Sodium retention is commoner with ACTH than with cortisone. Otherwise the effects on the course of rheumatoid arthritis are very similar.

#### Other Methods of Stimulating Adrenocortico-Steroid Production.

Two methods of stimulating adrenocortico-steroid production have been tried. One is the use of solutions of adrenaline (1:1000) in doses of 0.5 to one millilitre three times a day (Godowski, 1949). The adrenaline test for adrenal cortical activity advocated by Thorn, in which the fall in circulating eosinophile cells is taken to indicate an increase in the circulating adrenocortical steroids, makes use of a similar mechanism. The other is to use insulin hypoglycaemia to produce similar effects. In neither case does the level of circulating hormone attain the level reached by injection of cortisone or ACTH. A fall in eosinophile cells does occur with either technique.

I have tried the induction of insulin subcoma by the method used by psychiatrists. Ten units of soluble insulin are given at 5.30 a.m. and the effect is noted. This dose is increased by 10 units each morning until a mild hypoglycaemic reaction occurs. This usually requires 30 units, but doses of up to 100 units may be required. A carbohydrate-rich breakfast is given at 8 a.m. Close supervision of the patient is required to guard against deepening coma, and if this threatens glucose is given by mouth immediately. Glucose for intravenous administration should be available for emergency use. In favourable cases there is a gain in weight with some tendency to remission of the rheumatoid process. The eosinophile cell count is variable, but usually shows a fall. This treatment is insufficient in itself to cause remission and should be combined with other forms of treatment. Its use is tentative and experimental at this stage.

#### Δ<sup>5</sup> Pregnenolone Acetate.

The use of the steroid Δ<sup>5</sup> pregnenolone acetate has been advocated by Freeman *et alii* (1950), who have tried its effect in rheumatoid arthritis after experimental work on fatigue in airmen. It is regarded as a possible precursor of more active steroids. In a small series of cases I have observed no objective signs of improvement. The patients commonly reported a subjective improvement. In two female patients amenorrhoea occurred during its use, but menstruation was subsequently established. It is given by mouth in doses of 100 milligrammes three to five times a day.

#### Facilities for Treatment.

Some patients may be treated on an ambulatory basis without any sacrifice of therapeutic efficiency. However, many patients require prolonged care under the most meticulous supervision. The combined skill of physician, orthopaedic surgeon and specialist in physical medicine is needed if deformities are to be prevented. Once developed, these deformities are difficult and often impossible to remedy. The ancillary services of good nursing, careful physiotherapy and the benefits of occupational therapy and rehabilitation training are required to achieve the best results. There are too many cripples in our community whose lives could have been normal if proper treatment had been available. The discovery of cortisone is not likely to alter the outlook of rheumatoid arthritis for many years. We require properly equipped and staffed annexes to our general hospitals, where long-term treatment can be instituted and use made of all these components for treatment. I would urge the medical profession to support the Australian Rheumatism Council in its objectives—the improvement of training of undergraduates and graduates, the conduct of research, and the improvement of facilities for treatment. The proper application of orthodox methods of treatment can achieve good results if there is meticulous attention to detail. Future discoveries may revolutionize treatment, but at present most of the new discoveries are at the experimental stage.

#### Summary.

Rheumatoid arthritis is a disease of unknown aetiology showing a tremendously variable course. It may be divided into three stages: early active, late active, and inactive. In each stage the process may vary from mild to severe. Treatment depends on the correct assessment of the stage of the disease, with additional observations covering the personal and psychological characteristics of the patient. The objectives of treatment should be clearly realized. Certain recent advances in treatment are discussed, including the use of cortisone and ACTH and methods based on adrenocortical stimulation. The need for improvement in facilities for the treatment and rehabilitation in the more severe cases is stressed.

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# ORTHOPÆDIC ASPECTS OF RHEUMATOID ARTHRITIS.<sup>1</sup>

By GORDON COLVIN, M.B., B.S. (Sydney),  
M.Ch.Orth. (Liverpool),  
Sydney.

TONIGHT I wish to discuss in broad outline the orthopædic aspects of treatment in rheumatoid arthritis. A number of the points I desire to stress will already be known to you, but because of their importance I trust no apology is needed for their reiteration.

Rheumatoid arthritis and its resultant deformities are known to have afflicted mankind since the earliest of times. The pathological changes were described by Hippocrates, and Elliot Smith in his researches in Egypt has shown them to have been present in prehistoric animals. Treatment of the disease has always been empirical and symptomatic, and in the past efforts have often been directed to "curing" the disease with this or that potion, and too little regard has been given to maintaining joint motion and to the prevention of deformity.

If we are going to gain the patient's help and cooperation throughout the long and tedious *régime* demanded by this disease, it is essential that from the outset he be given a



FIGURE I.

complete understanding of its true course and nature. He should be warned of the inevitable joint involvement and of the danger of gross crippling deformity unless adequate precautions are taken. The part the patient must play in avoiding contractures and deformities of his limbs and in the retaining of joint movement requires explanation by the medical attendant. Finally, encouragement and an outline of the possibilities of modern orthopædic methods in preventing permanent crippling should be given. "Boosting" the morale of rheumatoid patients will do much to prevent the hopeless despair which can engulf these patients.

## BASIC PRINCIPLES.

Coming now to a consideration of the disease itself, firstly let us examine what are the basic principles in the physical management of a case of rheumatoid arthritis. They are as follows. (i) Rest, in the acute inflammatory stage, *plus* an active regard for strict control of posture to prevent deformity. (ii) Prevention of deformity due to (a) contracture of soft tissues, (b) bony fixation or ankylosis. (iii) Maintenance of mobility in its most useful range. (iv) Maintenance of muscle tone and circulation. (v) Correction of established deformity: (a) conservative, by splints, by traction or by manipulation; (b) operative. (vi) Rehabilitation and maintenance of improvement.

Let us take these main principles in order and expand them.

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on August 30, 1951.

## Rest.

Nature attempts to gain physiological rest for the affected joint by the aid of muscle spasm. This in itself aggravates the painful condition by forcing together denuded joint surfaces, which in turn gives rise to more spasm in the surrounding muscles.

Such painful spasm may be overcome by the employment of suitable splinting, which places the part at complete rest in the optimum position for recovery. This may call for the employment of a Thomas splint, abduction frame, plaster bed or simple plaster cast. Often traction will be required to overcome the spasm and to correct any existing deformity.



FIGURE II.

In the acute phase of the disease with painful swollen joints patients should not be allowed to remain ambulant, and the dictum to "keep going at all costs" is to be deprecated. Preventable damage is done to the joint surfaces and any existing deformity is aggravated by weight-bearing. The patient should be kept in a bed equipped with a firm mattress and such splinting or traction as is indicated by the extent of the disease. This should be continued until subsidence of the acute condition assessed by clinical, radiographic and pathological findings.

When this stage is reached, gentle graduated active exercises should be instituted, it again being stressed that the active cooperation of the patient and not passive movements by the physiotherapist are all-important.

In such acute cases prior to the advent of cortisone it was necessary to await subsidence of the acute phase before

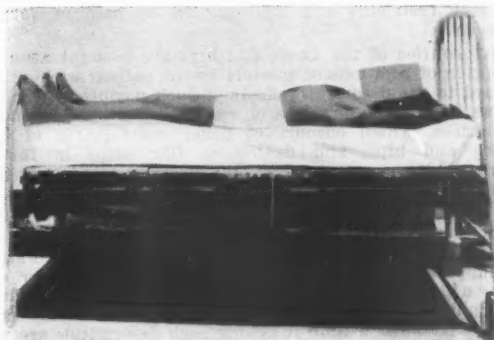


FIGURE III.

much could be done in the way of increasing joint movement. Now, however, it appears hopeful that earlier movement may be able to be introduced during the periods of retrogression brought about by the exhibition of this substance and, in addition, manipulation of affected joints may be performed at a much earlier period. It is too early as yet to assess the late results of such efforts, but present indications are hopeful.

### Prevention of Deformity.

With the patient in bed it is necessary that in addition to any form of medical treatment which may be instituted, a strict watch should be kept against the development of postural deformities. Whilst the spine and temporo-mandibular joints may at times be involved in this disease, it is deformities of the limbs which more commonly demand our attention.

#### Lower Limb.

Of the lower extremity, by far the most disabling deformity is a flexor contraction of the knee joints. When this is gross, it is impossible for the patient to walk in an upright position. When it is of lesser degree, attempts at walking impose continual strain upon the joint, increasing the deformity and adding to the joint damage.



FIGURE IV.

Often associated with deformity of the knees there is a flexor contracture of the hips, with or without, but more frequently with, an adductor component added. Motion may be very restricted and accompanied by pain of varying severity.

Deformities of the knees and hips are brought about by adoption of positions of comfort by the patient without any regard to the deforming effects of such postures. Figure I shows a common practice of employing a pillow beneath the knees, which encourages flexor contractures of both knees and hips, and flexion of the latter is further increased by propping the patient up into a sitting position.

Unless precautions are taken to relieve the weight of the bed-clothes from pressing on the feet, by the employment of a bed cradle, the ankles will be forced into equinus, a position in which the joint readily becomes fixed. Failure to support the ankles, either by means of a plaster cast or by a footboard and sandbags, allows an external rotation deformity of the leg and eversion of the foot to occur. Figure II shows a limb in which such deformities are well established.

In addition to these major joints the arthritic condition may involve any part of the tarsus. The foot may develop a valgus or, more commonly, a varus deformity, and the latter comprises one of the most disabling deformities of the disease. Extensor contraction of the toes and a rheumatoid condition of the metatarso-phalangeal joint of the great toe are also common disabilities.

Figure III depicts the method of nursing a patient to avoid the effects of a faulty posture. Fracture boards are placed beneath the mattress and a footboard is provided to prevent equinus, whilst sandbags should be added to

provide lateral support. In addition, a small pad should be placed behind the knees and similar pads of suitable size in the lumbar and cervical curves.

#### Upper Limb.

Deformity in the upper limb is partly due to muscle spasm, but more to the effects of posture and gravity. Figure IV depicts the common position of comfort in which the patient tends to hold the upper limb. Ulnar deviation



FIGURE V.

of the fingers at the metacarpo-phalangeal joints is a common deformity brought about through the adoption of this position of comfort, whilst wrist-drop and flexor contracture at the elbow are also frequently seen. Adduction of the shoulder joint is likewise an accompanying penalty of indulgence on the part of the patient and must be watched for by the medical attendant. Hyperextension of the proximal interphalangeal joints and an adduction deformity of the thumb also occur.

Figure V depicts a basic posture for the upper limb to prevent the development of these deformities. An axillary pad keeping the shoulders in abduction should be employed in addition. Should it be impossible to maintain active

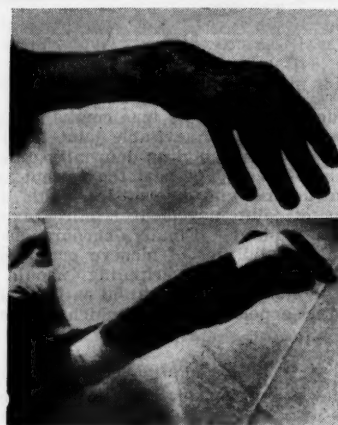


FIGURE VI.

flexion of the elbow from the extended position owing to involvement of this joint by the disease, support of the elbow at a right angle is to be preferred.

Wrist-drop and ulnar deviation of the hand should be controlled by a carefully moulded plaster cast, as shown in Figure VI.

The majority of these upper and lower limb deformities should be preventable, and in the early stages, being due to contracture of soft tissue structures, most should be correctable by conservative means. Later, when bony ankylosis ensues, operative interference is necessary should correction or mobilization be desired.

### Maintenance of Mobility.

It is a long-appreciated fact that if an osteoarthritic joint is placed at complete rest, as in a plaster cast, not only will pain be relieved, but the joint will gain in its range of movement. In rheumatoid arthritis, on the other hand, whilst rest and fixation do, it is true, bring about relief of pain, fixation invariably leads to further loss of function even unto bony ankylosis itself.

These facts being kept in mind, whilst it is necessary to place acutely inflamed joints at rest, it is essential that non-weight-bearing active movement should be instituted as soon as possible. Therefore, whilst being mindful of the possibility of straining or damaging an involved joint, the medical attendant should encourage early active movement of the part. It is here that the ancillary aids or physical medicine, such as the various forms of heat, paraffin baths *et cetera*, may play their part. Whilst they are of themselves by no means curative in nature, their assistance in aiding a maintenance of mobility sanctions their employment. Likewise, as was previously mentioned, as our knowledge stands at present, the beneficial effects of cortisone in aiding mobilization of joints may well make the continued use of this drug worth while, even though more lasting effects upon the joint disease may not be obtained.

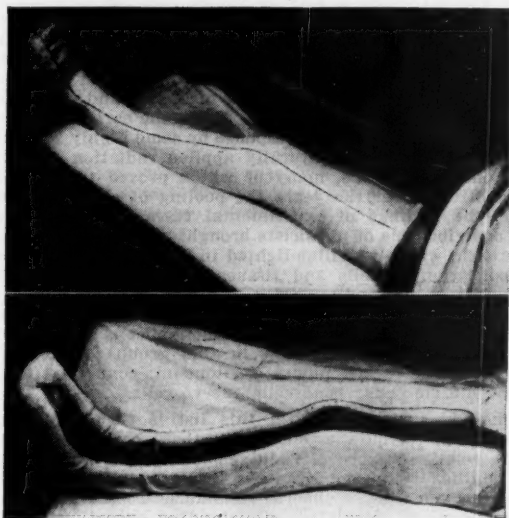


FIGURE VII.

The gradation of activity, from complete rest with active static muscle contractions until weight-bearing mobility is obtained, requires most careful control. At all times the patient's confidence must be maintained by the exhibition of a keen interest in his welfare by all associated with his rehabilitation. Ancillary aids to full mobility, such as correct footwear, metatarsal bars, short leg irons, calipers *et cetera*, should be employed whenever indicated.

### Maintenance of Muscle Tone.

All patients suffering from rheumatoid arthritis of any standing show muscle wasting and a poor circulation to the extremities. Physiotherapeutic methods should therefore be employed to relieve both these deficiencies.

The rebuilding of adequate muscle control over an involved joint and correction as far as possible of an impaired circulation comprise two of the most important factors in the rehabilitation of rheumatoid arthritic patients.

### Correction of Established Deformity.

Whilst every effort must be made to prevent the occurrence of deformities, much can be done to relieve these once they are established, and it is the common experience

of all orthopaedic surgeons to see people suffering unnecessary crippling and discomfort due to a lack of knowledge of just what can be done to overcome these disabilities.

It is not practical in a short discussion such as this to deal fully with all the decisions involved in deciding upon a line of treatment for any given patient. Each patient and each involved joint must be considered in the light of what is the optimum for that patient's needs. Time being our master, a brief outline of the methods of correction employed can alone be given.

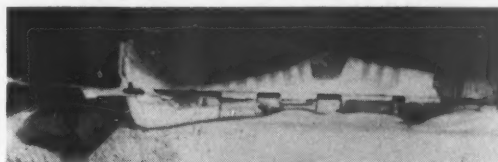


FIGURE VIII.

### Conservative Measures.

As was previously mentioned, much of the early deformity can be corrected by conservative means. Whilst correction by a series of plaster casts is most useful, as shown in Figure VII, which depicts a full-length cast which may be later reduced to a removable resting splint, slow continuous traction is without doubt the best form of treatment in overcoming soft-tissue contractions such as occur at the knee and hip. Figure VIII shows the employment of traction combined with a Thomas splint. If gross flexion is present, a two-way or a bent Thomas splint is necessary at the outset.

Manipulation of joints in rheumatoid arthritis has a limited though useful scope. It may be used to improve the useful arc of movement at a joint—for example, the elbow—or in gaining the final degrees of extension at a

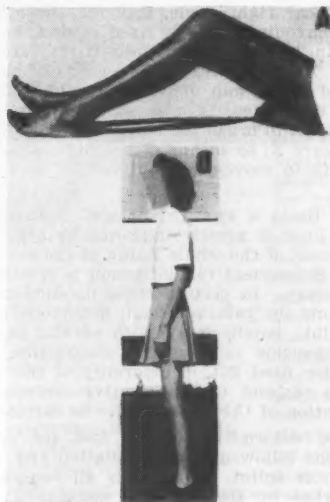


FIGURE IX.

knee joint which has previously undergone correction by plaster casts, traction and muscle reeducation. Figure IX graphically depicts the excellent results obtainable by this routine. The flexor contraction of the knee joint shown in the upper picture has been overcome completely, and the patient has been enabled to walk with a normal gait.

A warning of the damage which can be done by indiscriminate manipulation must be given. Too early and too vigorous manipulation will serve only to stir up the joint

symptoms, whilst unskilled and forceful manipulation may lead to subluxation of the joint. In this regard, particular care must be exercised when one is dealing with a contracture of the knee joint, in which one may be tempted to gain a quick result by force instead of by the slower procedure outlined above. Subluxation of the tibia on the femur is the probable result if such forceful methods are adopted.

#### Operative Measures.

**Hips.**—Whilst hip involvement in rheumatoid arthritis is not a particularly common occurrence, its effects can be extremely disabling. Ankylosis of one hip, provided the knees are mobile, is not a gross disability, but two stiff

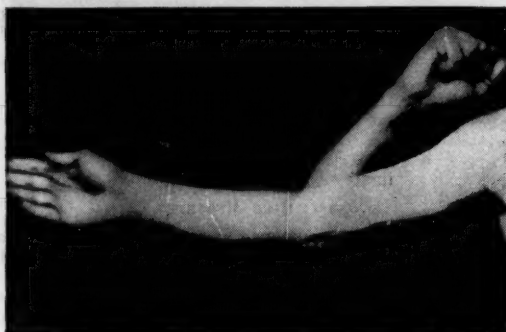


FIGURE X.

hips make an operation essential. Of a number of procedures available, cup arthroplasty is at present the probable method of choice, though some authorities prefer some form of excision osteotomy of the head and neck of the femur, as in the Batchelor operation. A useful range of movement, comparatively free from pain, can be expected following the performance of a cup arthroplasty operation.

**Elbows.**—One ankylosed elbow, if fixed in the optimum position of a near right angle, may not cause the patient any great inconvenience. Two fixed elbows, however, are a most disabling condition, especially if they are ankylosed in extension. Arthroplasty, the lower end of the humerus being removed and a gap of one and a half inches being left between the bones, is a most useful procedure and allows the patient to brush his hair, shave and feed himself *et cetera*. Figure X, by means of a double exposure, shows the useful gain in movement achieved by an operation of this type.

**Knees.**—At times a swollen, painful, hypertrophic condition of the knee is greatly improved by synovectomy—a complete removal of the whole lining of the anterior pouch of the knee. Subsequent rehabilitation is greatly enhanced by this procedure. In certain cases patello-femoral interlocking prevents the gaining of full flexion-extension range of a knee joint; patellectomy with careful repair of the quadriceps expansion removes this obstruction. Posterior capsulotomy for fixed flexion deformity of the knee which has failed to respond to conservative treatment permits further correction of the deformity to be carried out.

**Feet.**—Fixed deformities of the feet are overcome by wedge excisions followed by manipulation and the application of a plaster splint. Practically all feet can be made plantigrade whatever their original state.

**Hands.**—In the hands a most beneficial procedure when the thumb is ankylosed in adduction is an arthroplasty of the carpo-metacarpal joint. Likewise metacarpo-phalangeal and interphalangeal joints may be mobilized by arthroplasty. Wrist-drop can be corrected operatively and an arthrodesis in the optimum position performed.

#### Rehabilitation.

After the patient has regained his mobility, deformities have been corrected, and muscle power has been developed as far as possible, unless the patient's condition is one of

permanent invalidism consideration must be given to the finding of a suitable occupation. The patient's employment must be such as not to require postures which will bring on or aggravate any deformity.

Above all, there must be no relaxation in insisting upon the retaining of joint movement and in maintaining muscle development. These must be lifelong maxims to which the patient must steadfastly adhere.

#### CONCLUSION.

Finally, whilst we are awaiting a real cure for this condition, the discovery of which now seems more hopeful than ever before, let us keep these basic principles ever before us and be not neglectful or heedless of the deformities which may otherwise insidiously steal upon the patient.

#### MODERN TRENDS IN RADIOTHERAPY.<sup>1</sup>

By A. G. S. COOPER,  
Brisbane.

In general terms it may be stated that the outstanding trend in recent years has been in the matter of rationalizing the applications and in perfecting the technique of radiotherapy. Historically, it will be recalled that the first attempts at treatment were made within a brief period of years after the famous discoveries of X rays and radium by Röntgen and Curie respectively. When the earliest workers had observed a favourable response by some highly sensitive neoplasm, they quite naturally applied radiation to other malignant conditions, many of which proved to be radio-insensitive. Over the years the pooling of clinical experience, the findings of experimental research workers and the contributions of physicists brought about a more logical approach, which was high-lighted in 1932 with Desjardins's classification of cells and tissues in order of sensitivity. This list in descending order of sensitivity was given as follows: lymphoid cells (lymphocytes); polymorphonuclear and eosinophile leucocytes; epithelial cells (basal epithelium of testis being first in this group); endothelial cells of blood vessels, pleura, peritoneum; connective tissue cells; muscle cells; bone cells; nerve cells.

The important feature of this list is that, with some exceptions, tumours arising from these cells possess the same relative degree of radio-sensitivity. Every clinician is familiar with the dramatic response of the lymphosarcoma and the stubborn resistance of the osteogenic sarcoma when irradiated. Outstanding exceptions among malignant lesions are neuroblastoma in childhood and medulloblastoma. Cellular type is, however, only one of many factors to be considered in an attempt to estimate the radio-sensitivity of a tumour. For example, the response to irradiation is also influenced by rapidity of growth, histological grading and previous radiotherapy.

The earliest X-ray treatments were carried out with low-voltage apparatus, and the methods of measuring X-ray output were extremely inaccurate. The advent in 1928 of the international unit of X-ray quantity, denoted the Röntgen unit or *r*, constituted the greatest milestone in radiotherapeutic progress during the recent half-century. Its application paved the way for the outstanding work of Paterson and Parker (1934), who first described a radium dosage scheme in 1934 and followed this with additional details in the ensuing few years. Previous to this the dosage and distribution of radium were by "rule of thumb" methods. Concurrently with these advances in radium work, the development of shockproof X-ray equipment heralded the possibilities of high-voltage apparatus and the recently constructed "supervoltage" plants.

It may be of interest to refer briefly to the more promising types of megavoltage equipment. The cyclotron, the synchrotron and the betatron have an important place

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on August 3, 1951.

in experimental physics; but it has been found that their adaptation to clinical radiotherapy is fraught with many practical difficulties. In the first six months following its installation, the betatron at a large London centre was used to treat two patients.

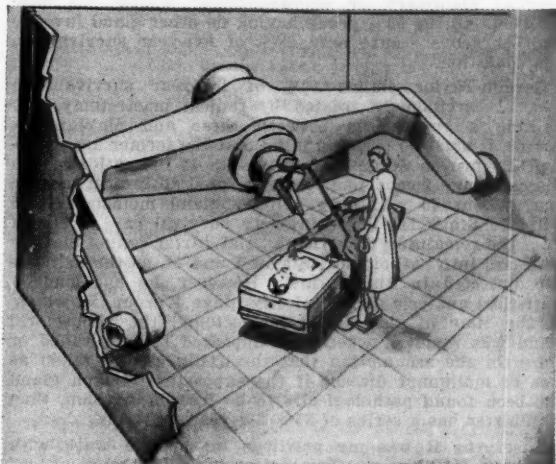


FIGURE I.

Proposed design of gantry-mounted 4-megavolt linear accelerator.

One million volt units energized by a resonant transformer or by a cascade generator have been developed and used for radiotherapy. However, it is understood that the expenses of running are heavy, owing to the high price and short life of suitable tubes.

A 2,000,000 volt unit energized by a Van de Graaf generator has been marketed by manufacturers in the United States of America (cost, approximately £25,000). One of these has been in use for over a year at the Sheffield National Centre of Radiotherapy and has, it is understood, given satisfactory service.

English physicists and engineers have planned a four megavolt (Figure I) and a 10 megavolt (Figure II) linear accelerator, and these units are just about to be installed for clinical use. If operational performance reaches expectations, one of these units may well prove the most desirable type of superelectric apparatus, for the following reasons. (i) Although the initial capital cost is high (approximately £40,000 sterling for the four megavolt unit), it is not anticipated that maintenance will be costly. (ii) The output is high (200r or more per minute at 100 centimetres focal skin distance). (iii) The depth dose is high—62% at 10 centimetres with 10 centimetres square field; 33% is the figure with 250 kilovolts and similar operating conditions.

Hitherto it has been the experience in deep X-ray therapy that success in localized malignant disease usually depends upon the ability to deliver an adequate and uniform dosage at a certain depth. This is only possible with conventional apparatus, when multiple fields can be directed to the tumour site. Frequently it is impossible to obtain the desired high dosage owing to the operation of limiting factors, such as skin reaction and increased ionization of the beam in bony tissue. Radiation dosage is the actual quantity of radiation energy absorbed in unit density material, and when a filtered beam from a 200 kilovolt apparatus strikes bone the dosage is locally boosted as much as 200%. With the  $\gamma$  rays of radium or superelectric X rays this increase is approximately 10% to 15%, and the hazard of bone necrosis is greatly reduced.

Having regard to the forementioned advantage of  $\gamma$  rays, it may be asked what are the possibilities in using large quantities of radium or other radioactive material to produce a beam of radiation? The largest radium beam units contain about ten grammes of radium, but for reasons of economy most contain four or five grammes. The output at a working distance of eight to ten centimetres is in the range between five and ten r per minute, and the depth dose can be estimated approximately by inverse square law.

Recently, however, radioactive materials produced in the plutonium pile have been utilized for  $\gamma$ -ray beam therapy. For this purpose the most suitable isotope is cobalt<sup>60</sup>, and a Canadian firm is advertising units containing up to 2000 curies (Figure III), giving an output of 30r per minute at a distance of one metre. The initial cost of this apparatus would be heavy, but maintenance expenses would not be high. Radio-cobalt has a half-life of 5.3 years, and both quantity of material and output would necessitate periodical adjustment.

#### Cancer of the Breast.

A new conception of the treatment of breast cancer has been put forward in recent years by Professor R.

McWhirter, of Edinburgh (1948), who advocates in Stages I and II a simple mastectomy followed by radiotherapy to the scar and to the axillary and supra-clavicular regions. It is held that in only a minority of cases is the disease still confined to the breast when the patient is referred for treatment. Surgical results are poor once the disease has extended beyond the breast. Handley and Thackray (1949) have shown that in many cases in which axillary lymph node metastases are present the internal mammary chain of glands is also involved (Table II).

Also the supra-clavicular lymph nodes are the site of metastases in 33% of patients having axillary gland metastases.

McWhirter has explained the rationale of his approach in the following way. There is a parallel case as between carcinoma and an acute infective process. No surgeon would attempt to operate on a patient with acute lymphadenitis of the axilla. It is technically impossible to perform a true block dissection of an axilla in the generally accepted meaning of the term. Tissues are usually removed piecemeal, lymphatics are cut across and neoplastic cells are inevitably disseminated. The operation of radical mastectomy can be a most impressive surgical exercise,

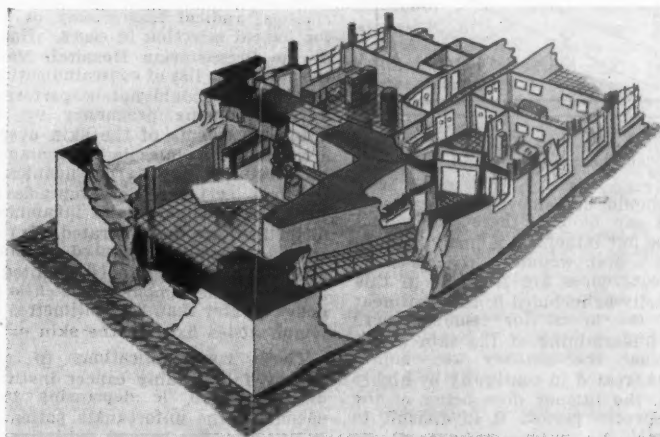


FIGURE II.

Perspective view of proposed 10-megavolt linear accelerator installation at Hammersmith Hospital.

but it must be admitted that the statistical results are disappointing, the majority of cures arising in Stage I carcinoma.

McWhirter admits freely that the best treatment of a malignant mass anywhere is surgical removal, provided that this is possible of complete achievement. A proportion of breast tumours is radio-resistant, and this type cannot be identified by histological means with any certainty. Therefore the breast, including the tumour, should be removed by simple mastectomy, the pectoral fascia being taken only when tumour is adherent. If the subpectoral

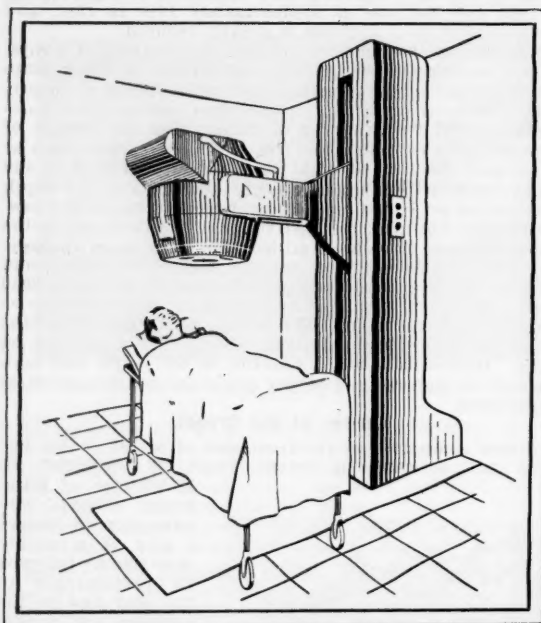


FIGURE III.  
"Eldorado" cobalt "60" beam therapy unit.

nodes are palpable they should be removed; but even if the axillary lymph glands can be felt, these glands and the axillary fascia should be left intact. It is inadvisable to establish drainage through a stab wound in the posterior aspect of the axilla, as recurrences are frequent in this scar and the area cannot easily be included in the treatment field. In the freeing of the breast for removal there should be a minimum of undermining of the skin edges.

McWhirter maintains that the axillary and supraclavicular regions should be treated in continuity by highly filtered deep X-ray beams, the tumour dose being of the order of 3750r in a three-weeks period. It is difficult to obtain this dosage in extremely fat subjects, and accordingly no deep therapy is given to these patients, who have a radical mastectomy as the least of evils. Deep therapy is to be avoided also in cases of Raynaud's or Buerger's disease, and aged patients receive an abbreviated course and lower dosage.

A point of much interest is that this worker has a group of cases of pregnancy and lactation carcinomata of the breast with 30% of five-year survivals. It is emphasized that no surgical treatment whatever should be used on this type of neoplasm. When surgery has been the chief method of treatment it has been unusual to find any five-year survivals.

On being questioned regarding the appropriate treatment of an early mammary carcinoma in a patient, aged thirty-five years, with no clinical evidence of gland metastases, Professor McWhirter considered the above-described routine to be the method of choice for all operable Stage I and Stage II carcinomata, and for some of Stage III (excluding

pregnancy and lactation cancers), and he gave the following reasons. Either this hypothetical patient has no gland metastases in the axilla, in which case dissection is futile, or alternatively there are metastatic glands in the axilla. In the latter eventuality there is a 40% chance that internal mammary or supraclavicular glands are also involved. In the 60% group having no other gland involvement surgeons secure only 28% of five-year survivals in this condition.

Gordon-Taylor claims 80% of five-year survivals in Stage I carcinoma treated by radical mastectomy. In striking a comparison between these and McWhirter's figures, it must be borne in mind that the former are pathologically proven Stage I carcinomata. If 100 patients with clinical Stage I carcinoma are subjected to radical mastectomy, about 40 will have axillary gland metastases and fall into Stage II. The surgeon's survival rate is struck from the remaining 60 patients. McWhirter cannot classify his cases into pathological Stages I and II, as the axilla is not dissected in his routine. However, he has made a statistical analysis of a clinically Stage I group, in which, at the time of the simple mastectomy, the subpectoral gland was removed whether it appeared to be invaded or not. On the assumption that the axilla can be taken as free of malignant disease if the subpectoral lymph gland has been found pathologically to be free of invasion, then McWhirter has a series of 85% five-year survivals.

Last year it was my privilege to spend a week with Professor McWhirter. One could not fail to be impressed by the well-organized department, with its excellent progress inquiry section and system of records. (Lost patients have been virtually eliminated.) Having seen the large number of patients, each exhibiting a simple mastectomy scar and reporting back with a favourable result, the visitor finds it easier to appreciate that this clinic has produced the best overall five-year survival figures so far published for carcinoma of the breast (Table I).

On the assumption that there is still a place for the classical radical mastectomy of Halsted, a plea is made for logical selection of cases. Haagensen (1949), working at the Presbyterian Hospital, New York, has formulated the following list of contraindications to operation. Radical mastectomy should not be performed when (i) carcinoma develops during pregnancy or lactation, (ii) there is extensive oedema of the skin over the breast, (iii) there are satellite nodules in the mammary skin, (iv) there are intercostal or parasternal nodules, (v) there is oedema of the arm, (vi) there are supraclavicular gland metastases, (vii) the carcinoma is of inflammatory type, (viii) distant metastases are demonstrated, (ix) any two of the following signs of locally advanced carcinoma are present: (a) ulceration of the skin, (b) limited oedema of the skin, (c) fixation of the tumour to the chest wall, (d) axillary lymph nodes greater than 2.5 centimetres in diameter, (e) axillary lymph nodes fixed to the skin or deep structures.

These contraindications to radical mastectomy are approved in leading cancer institutes, and when they are disregarded it is depressing to the radiotherapist to encounter the unfortunate patient after operation. There is little to offer beyond palliative radiotherapy, which will maintain life for a year or two. Therapists would welcome the opportunity to examine before operation all patients suffering from mammary carcinoma. If this is not practicable, a full clinical description should be given when a patient is referred for post-operative deep X-ray therapy. As the radiotherapist's approach varies with the site, type and extent of the tumour present, it is held that the practice of referring a patient for radiotherapy with inadequate operative findings is much to be deprecated.

When supraclavicular gland involvement is discovered a few weeks after a radical mastectomy, it does not necessarily follow that these nodes were enlarged and overlooked in the pre-operative assessment. The "cancerologist" sees many instances of rapidly spreading malignant change after a surgical operation or after trauma. It has been postulated that trauma to tissues liberates a growth-promotion factor which initiates the mechanism of repair in normal tissues and at the same time stimulates any

neoplastic cells present in the body. It is predicted that more will be heard in the years to come of this little understood phenomenon, and perhaps its recognition may prove to be one of the stepping stones toward the eventual discovery of a simpler and more effective cure for malignant disease.

TABLE I.  
*Lymphatic Spread of Breast Cancer in Relation to Site of Primary Growth.*  
(After Handley and Thackray, 1949.)

Lymphatic Involvement.	Site of Primary Growth.		Total Cases.
	Inner Half of Breast.	Outer Half of Breast.	
Total cases	17	33	50
All lymph nodes free from growth	4	12	16
Internal mammary nodes alone invaded	2	1	3
Axillary nodes alone invaded	1	14	15
Both axillary and internal mammary nodes invaded	10	6	16

### Carcinoma of the Cervix Uteri.

In the treatment of carcinoma of the *cervix uteri* various new methods have been recorded; for example, parametrial radium implants and per-vaginal X-ray therapy. Heyman has summarized the position by stating that no new method has given significantly better results than those recorded from intracavitary radium implantation by the Paris or Stockholm methods or some modification thereof. The same

TABLE II.  
*Compiled from Figures given by McWhirter, Showing the Findings in 1,345 Cases Referred in 1941-1945.*

Group.	Percentage (Subgroup).	Percentage (Group).
Operable <sup>1</sup> (757):		60
(a) Axillary glands negative .. Axillary dissection unnecessary. Simple mastectomy plus X-rays (five years survival rate, 89%).	24 (40% of operable cases)	Five years' survival rate, 62%
(b) Axillary glands positive .. Disputed group. Simple mastectomy plus X-rays (five years survival rate, 44%).	36 (60% of operable cases)	
Inoperable <sup>1</sup> (radical operation) ..		40
(a) Advanced locally (369) .. Radical mastectomy contraindicated. Simple mastectomy plus X-rays or X-rays alone.	25 (five years survival rate, 29%)	
(b) Distant metastases .. No treatment or palliative treatment.	15	
Total percentages .. ..	100	100

<sup>1</sup> Every case (treated and untreated) in patients coming to hospital (1,345) five years survival rate, 43.7%. All cases without evidence of metastases (1,146), five years survival rate, 50.5%.

authority advocates radiotherapy for new patients in all stages of the disease in preference to surgery. At the Radiumhemmet and other leading cancer clinics in Europe surgery is reserved for the small percentage of "failed radium" cases. Survival figures published by various centres show no excessive variations, and almost without exception the radiotherapeutic results are more favourable than those obtained by surgery.

### Carcinoma of the Ovary.

In the treatment of carcinoma of the ovary it has for long been the accepted practice to carry out panhysterectomy and to request post-operative deep X-ray therapy.

This treatment has been effective in the more radio-sensitive lesions and in early conditions which have not metastasized and are essentially surgical "cures".

When the uterus has been removed and the vaginal fornices have been foreshortened or obliterated, the radio-therapist is unable to deliver throughout the pelvic cavity a full cancericidal dose of radiation. Heyman has suggested that in these cases a bilateral ovariectomy only be performed, the uterus being left as a convenient holder for radium sources. In this way a useful pelvic dosage of radiation can be given, and it seems unlikely that any neoplastic cells in the uterine tissues would survive.

### Carcinoma of the Lip and of the Tongue.

The successful results obtained by means of radiotherapy in the treatment of early primary malignant growths in the lip and the tongue are well known. It is also conceded that surgery provides the method of choice in eradicating accessible metastatic lymph nodes. However, there is still some lack of unanimity amongst surgeons and cancer workers in regard to the value of and indications for prophylactic dissection of cervical lymph nodes. For some time it has been the practice in Brisbane radiation clinics to recommend for cervical gland dissection only those patients with clinical evidence of metastasis. An exception is made in advanced cases when, for any reason, an adequate follow-up routine is not practicable. It is of interest to note an authoritative article from the pen of Hayes Martin (1951), from the Head and Neck Service of the Memorial Hospital, New York. He has shown that of 297 patients with determinate lip cancer, 237 presented with no clinical evidence of metastases on their admission to the clinic. These 237 patients would have been candidates for a cervical gland dissection, but this procedure is not the policy of the author's practice. In 20 patients the primary lesion was not controlled; in four patients the cervical metastases developed on the contralateral side; and in 187 patients no metastases developed. This left a balance of 26 patients in whose treatment prophylactic dissection would have been of theoretical value. Eleven out of the 26 had successful treatment. There remained 15 patients, 6% of the sample, in whom an early prophylactic dissection might have been of value.

In Queensland the frequency of metastases in cases of epithelioma of the lip is approximately 5%, compared with 12% in Martin's series, and the indications for prophylactic gland dissection are very unconvincing.

When a similar statistical analysis was applied to patients afflicted with cancer of the tongue, it was shown that in only 20% could gland dissection have been of any possible benefit.

In a majority of the larger English centres of radiotherapy the policy has recently veered away from prophylactic dissection toward a system of regular follow-up examinations and recourse to surgery when metastatic nodes are found.

### Therapeutic Possibilities from Radioactive Isotopes.

Isotopes are elements of identical atomic number but of different atomic weight. The term is derived from a Greek word meaning "same place". Many of the isotopes are unstable and spontaneously undergo transmutation, emitting in the process radiation of various types. It is asserted that there have now been identified 500 artificially produced radioactive isotopes with half-lives ranging from seconds to millions of years.

Because the chemical properties of an element are determined by the electrical charge on the nucleus, or in other words by its atomic number, the radioactive isotopes lend themselves ideally to tracer investigations. With the use of radioactive iodine, I<sup>131</sup>, it was found that the concentration of this substance in the normal thyroid gland was approximately 12%. In hypothyroidism the concentration was under 1%, and in thyrotoxicosis the figure rose to retention of 30% to 50%. This usage of "tagged" atoms opens up a very wide field in scientific and medical research.

Radio-iodine, by virtue of the high uptake in the over-active thyroid gland, promises to be useful in thyrotoxicosis, and some workers in the United States of America have claimed good results. Up to date the use of this material has been limited in Australia by the short half-life (eight days) and attendant difficulties in transportation. It appears that only a small percentage of thyroid neoplasms have any pronounced avidity for iodine, and therefore its application in the therapy of malignant disease is restricted.

Radio-phosphorus is selectively deposited in the nuclei of rapidly multiplying cells and in bone. It can be used to treat Hodgkin's disease and other reticulo-endothelial diseases. Most workers in this field feel that the results in the above-mentioned diseases and in the chronic leukaemias are not quite so good as with X-ray therapy. However, the use of  $P^{32}$  has proved itself the treatment of choice in *polycythemia vera*, which responds to adequate dosage with remissions of six months to three years in 85% of patients treated. Radio-phosphorus,  $P^{32}$ , which has a half-life of 14.3 days and is a  $\beta$ -ray emitter, is usually given intravenously in the form of a sterile isotonic solution of sodium acid phosphate. It must be understood that only one phosphorus atom in approximately 500,000 is radioactive in the material administered.

Radioactive sodium has no specific parenteral application, as it is soon distributed uniformly over the body and produces an effect similar to teleröntgen therapy, the so-called "spray" radiation or "body bath". An interesting local application of radioactive sodium,  $Na^{24}$ , is described by Sinclair and others at the Royal Cancer Hospital, London. A technique has been developed for the treatment of carcinoma of the urinary bladder, this isotope being applied in an inflatable rubber bag. When 400 millicuries of  $Na^{24}$  are used, the treatment time is of the order of three hours with a dosage on the mucosa surface equivalent to 3000 $\gamma$  and 4000  $\beta$ -ray  $r$ . These relative dosages can be varied by the use of radioactive bromine and other materials. It is necessary to employ elaborate methods for protection of the staff from stray radiation, but contamination of apparatus is not a troublesome factor owing to the rapid decay of the isotope.

Radioactive gold has been injected into the peritoneal cavity in an endeavour to control small nodular metastases from ovarian and other forms of intraabdominal malignant disease.

For external beam therapy radio-cobalt has already received mention. It may also prove useful as one of the most promising substitutes for radium in needles and tubes for interstitial and intracavitary application. Radio-strontium is a  $\beta$ -ray emitter and attracts attention as a possible substitute for radium or radon in plates where  $\gamma$  rays are superfluous.

#### Results of Treatment.

Every radiotherapeutic centre provides a follow-up service for its treated patients and compiles a statistical assessment of results of treatment. The subject is receiving attention at the present time by an expert committee on health statistics appointed by the World Health Organization. It is the intention to recommend, after exhaustive investigation, uniform methods of presenting statistical results in cancer cases. Hitherto most centres have taken the percentage of five-year survivals as the best criterion, but some uncertainty prevails over the method of dealing with the items of untraced patients and deaths from intercurrent diseases. Because of a desire to evaluate changing techniques in therapy, these statistical returns are of greater importance to the radiotherapist than to most other consultants, and a plea is recorded for care in the medical certification of death. In this connexion grateful acknowledgement is made to those clinicians and colleagues who have provided over the years progress reports which have helped to bring many patients' records up to date.

#### Conclusion.

In conclusion, I should like to say that in this paper I have merely touched on several aspects in the changing face of radiotherapy. As in other branches of medicine,

new methods of treatment are subjected to a critical analysis and are evaluated in the light of biophysical principles and general experience before being adopted in practice.

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### OBSTETRIC EMERGENCIES FOLLOWING DELIVERY.<sup>1</sup>

By D. F. LAWSON, M.R.C.O.G.,  
The Women's Hospital, Melbourne.

THE most dramatic and worrying obstetrical emergencies usually occur within the first few hours after delivery. Although it is obvious, it is perhaps necessary to say that the best way to deal with emergencies in this category is to anticipate them and to forestall them. Enough people have been in trouble in the past and have recorded their experiences to enable us to recognize the background out of which disaster can appear, and we should utilize this existing knowledge to prevent to a very great extent the appearance of serious trouble and anxiety.

The most common emergency following delivery is post-partum hæmorrhage. If a patient has had an entirely normal delivery and subsequently has a post-partum hæmorrhage there are real grounds for suspicion that the third stage has been mismanaged. However, there is a group of cases in which the labour and the method of delivery are not normal. In this group we have real reason to anticipate the occurrence of hæmorrhage. As we know in advance that the labour is not normal and that the delivery is not likely to be normal, we are forewarned of the possibility of trouble with the third stage in these cases and should be ready to take adequate steps to deal with it before it occurs.

The steps we can take are both prophylactic measures and those which concern the treatment of the bleeding and the replacement of blood. One of the very important prophylactic measures is to make certain that when the patient comes into labour her hæmoglobin level is high. This means that we consider it desirable that the hæmoglobin value should be estimated in all pregnant women and that if it is low steps should be taken to see that this state of affairs is corrected. This step is perhaps the most important single preventive measure which can be taken to reduce to a minimum the emergencies and anxieties that arise after delivery.

The next prophylactic step that can be taken in the treatment of a patient from whom we anticipate difficulty is to determine what her blood group and Rh status are before the labour is complicated. Knowledge of these facts may save important minutes in a crisis, and such data are very much appreciated by those in charge of the stocking of blood banks, as these people have difficulty in maintaining adequate stocks of O(IV) Rh-negative blood.

The third important step is to do all that is possible to sustain the strength and morale of the patient whose labour is protracted. Any woman who labours for more than forty-eight hours is likely to be acidotic and dehydrated, and in all such cases steps should be taken to prevent this condition from arising. Steps must be

<sup>1</sup>Part of the week-end course at Horsham (Melbourne Permanent Post-Graduate Committee), October, 1950.

taken by the nursing staff to ensure that the patient has an adequate fluid intake, but at times, for various reasons, it is difficult for the patient to maintain an adequate fluid intake, and under those circumstances fluid should be given intravenously.

It needs to be emphasized again and again to nursing staff caring for women in labour that fluid taken in small frequent sips is much more likely to be absorbed than fluid taken by the eight-ounce glassful at one time. Fluid taken by the glassful often merely lies in the stomach, to be returned unchanged to the kidney dish at regular intervals.

Anæsthesia is another factor which is known to enhance considerably the prospects of post-partum hæmorrhage, so means by which anæsthesia can be reduced to a minimum will lessen the prospect of blood loss. The following rules are suggested.

1. Begin the necessary manipulations as soon as the patient is anesthetized to the desirable depth, but at the same time be careful not to start too soon. We have all started too soon in one case or another, the result being that the patient rears out of the position into which she has been laboriously lifted by the nursing staff.

2. Utilize the time during which anæsthesia is being induced by preparing things that will or may be needed; that is, see that sutures are at hand and that they are threaded onto the appropriate needle. If this is done, then the suturing of any ordinary episiotomy incision or tear can be proceeded with the moment the child is born. It is then usually possible to complete the suturing without giving any further anæsthetic after the delivery of the child. These statements are based on the assumption that the patient who has the ordinary type of forceps delivery will require an episiotomy or will sustain a perineal tear. I know that there are exceptions to this rule, but preparations should be based on the normal expectations and not on the exceptions.

This technique can be varied in the case of the patient who has had a long labour, whose delivery is effected after a difficult forceps application and in whom a very large episiotomy incision is necessary. In these circumstances I think there are two alternatives open to us. The first one is to ignore the episiotomy until the third stage has been completed, and then, after the drugs have been given and the uterus is firmly contracted, reanæsthetize the patient and repair the extensive episiotomy incision at leisure. The other way to deal with this problem is to give the patient 0.25 milligramme of ergometrin intravenously when the anterior shoulder is born, then deliver the placenta immediately, either by expression or by manual removal, and after having given the patient pituitrin as well, proceed then with the repair of the episiotomy incision. There is nothing more upsetting than to spend time and energy carefully repairing a large episiotomy incision and then subsequently to rip the perineum asunder because the third stage has been abnormal and a manual removal has been necessary. It is with the large episiotomy incision that this upsetting circumstance is most likely to arise.

As far as the actual management of the third stage is concerned, the important points are that the fundus should be carefully watched, with a hand gently placed on the abdomen if the *accoucheur* prefers it that way, or simply by observing its situation and shape in the abdomen. When the signs of separation of the placenta become apparent, the placenta should be expressed with the next contraction. The most vital point in the conduct of the third stage is that there should be no procrastination in the presence of bleeding. Once bleeding has taken place, the placenta must be removed with reasonable promptitude, and I believe that the safest rule to observe is that if one properly conducted Credé's expression does not result in expulsion of the placenta manual removal should be carried out at once.

There is the odd occasion when a patient will have a rapid, severe hæmorrhage, and will have been precipitated into such a state of shock and collapse that manual removal would seem a hazardous procedure without prior

resuscitation. In these circumstances the best thing to do is to give ergometrin intravenously and pituitrin intramuscularly at once. This usually will produce a sufficiently strong uterine contraction to stay further bleeding, and the patient can then be resuscitated and brought to a state in which it is thought that she can withstand the interference necessary for manual removal of the placenta.

Very often, however, by the time the patient has been resuscitated sufficiently under the influence of the drugs and of the blood transfusion that have usually been given, the separation of the placenta is completed and it can easily be expressed. In the presence of a firmly contracted fundus—I repeat this—in the presence of a firmly contracted fundus, I have no hesitation in attempting gentle traction on the cord in an endeavour to extract the placenta.

Post-partum hæmorrhage is not always from the placental site. Severe hæmorrhage can occur from trauma, and the classical method of differentiating traumatic from placental site bleeding still applies—that is, that the bleeding continues independently of the stage of contraction or otherwise of the fundus. Bleeding from the torn cervix is a type that seems most talked about, but the commoner type seems to be from vaginal and vulval lacerations, particularly from varicose veins, which, unfortunately, sometimes abound in the vulval region at the end of pregnancy. The control of bleeding of this nature is obtained when the lacerations are sutured. Sometimes this bleeding is alarmingly rapid and it is necessary to exert wide pressure over the lacerated areas to control it. This pressure is usually best exerted with the flat of the hand over a perineal pad, and then with the gradual retraction of the hand and pad the torn area is brought into view little by little and sutured.

The third type of bleeding is that which results from trauma to deep-seated vessels, and which leads to the production of hæmatomata; these hæmatomata are classified as internal or external according to whether they are deep to or superficial to the *levator ani*.

These lesions adversely affect the patient on account of the pain they produce and the blood loss incurred, but generally they are best treated expectantly with morphine and blood transfusion if necessary. To incise a vulval hæmatoma is often to release the pressure that has controlled the hæmorrhage and to be then presented with a raw, oozing surface, bleeding from which is difficult to control without packing. This packing carries with it, of course, a real risk of infection and subsequent vulval scarring. When the hæmatoma is internal there is frequently an associated laceration of the vaginal wall in its upper half. The hæmatoma may spread backwards to press on the rectum and to produce rectal pain, or it may spread upwards, in which case the complaint will be of lower abdominal pain. The fundus may be displaced upwards into the abdomen. Fortunately this condition is rare, but it can be most alarming.

Recently, four hours after a normal delivery, a patient went into a state of shock and collapse. The fundus was high under the left costal margin, and after resuscitative methods had been initiated, the patient was examined vaginally and found to have a tear about two inches in length high up on the right lateral aspect of the vaginal wall. Through this laceration about two pints of blood were evacuated, with relief of pain and improvement in the general condition. After a short while it was apparent that the fundus was again being pushed up into the abdomen, and a further considerable amount of blood was evacuated through the vaginal laceration. After that the fundus maintained a central position, and it was assumed that further significant hæmorrhage had ceased.

During the resuscitation of this patient four pints of blood were given. Four days later her hæmoglobin value was 50%, which gives some idea of the amount of blood which had been lost into this internal hæmatoma.

Rupture of the uterus is fortunately rare, but it is a disaster that can occur whenever there have been intra-uterine manipulations and whenever difficult forceps delivery has been performed. There is something to be said for the current tendency to give oxytocic drugs and

to remove the placenta manually immediately after any difficult or complicated delivery. This manoeuvre can lead to the early recognition of rupture of the uterus in the rare cases on which it has occurred. The possibility that the uterus has been ruptured must always be considered when the patient goes into an otherwise unexplained state of shock and collapse after delivery. If the placenta is expelled into the abdomen and the cord disappears up the vagina, the diagnosis is easy; but in the absence of this helpful phenomenon, the diagnosis is established by the obstetrician's first having thought of the possibility of the condition, and secondly, having gently explored the uterus to determine its intactness or otherwise.

Incomplete rupture of the uterus does occur and is best treated conservatively, with morphine, blood transfusion *et cetera*. Complete rupture of the uterus is treated by hysterectomy, though in the odd case it may be possible to repair the uterus and not remove it.

Inversion of the uterus is another emergency that arises from time to time, and the greater the delay in diagnosis, the more of an emergency does it become. If it is recognized that the uterus is inverted, the moment that the inversion occurs the best treatment is immediate reinversion. If there is delay in diagnosis (and it seems that a common mistake is to regard the inverted fundus as an extruded fibroid tumour), shock and blood loss become significant and the immediate treatment is resuscitation. This may involve the giving of many pints of blood.

During this period oxytocic drugs are usually given and the tonic effect that they have upon the inversion cup usually makes subsequent replacement of the uterus more difficult. When restoration of the patient's condition has been achieved gentle manual reposition may be attempted, and if that fails Huntington's operation may be performed.

In this procedure the abdomen is opened through the lower mid-line incision and through the inversion cup, the posterior peritoneal surface of the uterus is grasped with suitable tissue forceps, and gentle upward traction is maintained. The tissue forceps are climbed over each other down the posterior wall of the uterus until reinversion is completed. This operation can usually be well performed quite rapidly, and as a rule there is a dramatic improvement in the patient's condition when reinversion has been achieved.

In terms of the misery that may ensue, the complete perineal tear is a major emergency. The prospects of obtaining a good operative result after such an injury are greatest immediately after it has occurred. At this stage there is no scar tissue and the blood supply to the perineum is very good. It is therefore very important that a favourable circumstance which exists only at this time should be used to the best advantage.

In the vast majority of instances the instruments available on the trolley usually prepared for a vaginal delivery are quite inadequate for satisfactory repair of a torn anal sphincter. Therefore, if such an injury occurs, the wisest thing to do is to ignore it and proceed with the completion of the third stage; then, as soon as it is possible after delivery to have adequate instruments, appropriate sutures, proper lighting and the facilities to have the patient in a proper position, the torn sphincter should be repaired.

If obstetricians took as much care over the repair of a complete tear as is taken over an interval appendicectomy, the probabilities are that the gynaecologists would never see this condition. Subsequently the patient should have penicillin and sulphonamides in adequate dosages. The bowels should be induced to act on the fourth or fifth day by the use of paraffin oil, with small doses of whatever other aperient the patient or the person in charge prefers.

The things to be avoided in the after-treatment of this condition are enemata and the development of scybulous masses of faeces. This latter condition is likely to occur if an attempt is made to confine the bowels for more than a few days. Even the most skillfully executed repair can be torn asunder by the passage of a hard mass of impacted faeces.

Sometimes we see patients in a most frightening condition as a result of the inhalation of gastric contents following anaesthetic vomiting. To a degree this is a preventable emergency. Vomiting often occurs in any long labour, and if in a long labour a patient has been vomiting dark green or black fluid, it is wise to empty the stomach with a tube before inducing anaesthesia.

However, there will probably always be the odd *multi-para* who has her dinner at 6 p.m. and her baby at 8 p.m., and in whom the risk of inhalation of vomitus is very real. These patients can present an alarming picture—cyanosis, dyspnea, chest retraction, a rising pulse rate, and a constant cough which is distressing to listen to and must be much more distressing to have. In some instances immediate bronchoscopy is essential, but in less severe cases the condition of the chest can be followed clinically and radiologically, and the necessity for bronchoscopy can be determined by the way in which the chest lesion progresses. Chemotherapy to lessen the ill effect of the pneumonia which is likely to develop is desirable.

Another really acute problem, though perhaps less recognized as such, is sleeplessness in the days following delivery. Almost all the patients who develop puerperal insanity complain of sleeplessness before the distressing condition finally manifests itself. It is only in retrospect that the significance of this inability to sleep is realized. Puerperal insanity is most likely to develop in patients who have had toxæmia and severe anaemia, and in those with a previous history of mental disturbance. For these patients it is a matter of some urgency that they should sleep well *post partum*. It does not matter what sedative is used in these instances as long as it is successful in attaining the all-important objective of a good night's rest.

... Sore labour's bath,  
Balm of hurt minds.

If a patient has some condition coincidental to the pregnancy, that condition may make a state of affairs which, although relatively unimportant to the ordinary patient, is a matter of urgency in her case. Tuberculosis is such a condition. It is well established that the puerperium is a time in which patients can suffer relapse or activation of their infection, and debility is an important factor in making this possible. So in the tuberculous patient, post-partum debility is a condition that must be tackled with all possible speed and urgency.

One other problem that can arise in the course of a difficult delivery is separation of the *symphysis pubis*. There are widening of the symphysis and some softening of the ligaments during pregnancy, and in the course of a difficult delivery there may be disruption of the symphysis. Usually there is a loud and ominous crack to announce this accident. On occasions the urethra has been forced into the resulting gap and compressed by the rebound when the delivery is completed. If this occurs, the gap must be re-created by external pressure and a catheter passed into the urethra, which can then be manoeuvred forward out of the way. The patient should then be put into a plaster cast from nipple-line to mid-thigh, and as a rule it is at least six weeks before any weight-bearing is desirable.

The final emergency to be discussed is that of obstetric shock. Sheehan has summarized the factors which predispose to shock, and a study of his list of predisposing causes gives an important lead as to how to deal with patients in such a way that in most instances the shock can be averted.

Sheehan's list is summarized as follows. (i) Long labour, which may be associated with (a) babies weighing over nine pounds, (b) artificial delivery, with which is often associated bruising of the trigone, (c) acidosis from starvation and dehydration, associated with which is often a high non-protein nitrogen content of the blood. (ii) Factors associated with the third stage: (a) retained placenta for over two hours even in the absence of blood loss, (b) repeated attempts at expression of the placenta. (iii) Toxæmia with pregnancy: (a) shock in association with severe concealed accidental haemorrhage, (b) idiopathic shock sometimes occurring in hypertensive patients after delivery. (iv) Caesarean section.

Sometimes severe shock is seen after an uncomplicated straightforward Cesarean section.

The treatment of obstetric shock is to replace blood loss if there has been any, and to correct anaemia if it existed before the onset of the labour. In addition an attempt should be made to restore the blood pressure as rapidly as possible by means of the intravenous administration of normal saline. The saline should be given as rapidly as possible—for example, two litres may be given within half an hour—and in such quantities as are necessary to restore and maintain the blood pressure. If the normal saline has been given too rapidly or in too great a quantity, there will be evidence of venous engorgement, and further suggestive evidence is a pulse rate which rises after an initial fall.

A very considerable fall of blood pressure is characteristic of obstetric shock, but it does occur in a number of other conditions following delivery. It is important that the period during which the blood pressure is low is cut to as short a time as possible, because a period of low blood pressure can bring in its train a whole fresh set of problems. As a result of a period of low blood pressure a patient can develop anuria from renal anoxia, insanity from cerebral anoxia, cardiac failure from cardiac ischaemia, and post-partum pituitary necrosis. The last mentioned follows pituitary infarction, which is considered to be due to the slow circulation through a previously very vascular gland. According to the size of the infarct the patient will subsequently manifest signs of hypopituitarism or Simmonds's disease.

Suppression of urine is a much discussed and investigated subject at the moment, and in this context it is perhaps sufficient to say that the commonest cause of death in anuria is over-treatment. We often kill the patients before the natural tendency to recover has had time to manifest itself. The most important points in the treatment of the condition are to combat any infection that is present, to correct any anaemia, and to see that the patient gets her physiological fluid requirements, and no more than that amount, either by mouth or intravenously. In the vast majority of instances spontaneous diuresis will occur within six to ten days. Spontaneous diuresis occurs in such an erratic fashion that it is extremely difficult to assess the value of the many treatments advocated for this condition.

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### ASCARIASIS IN SYDNEY CHILDREN AND ITS RELATION TO THE URBAN BACKYARD.

By T. C. BACKHOUSE and A. J. BEARUP,

From the School of Public Health and Tropical Medicine, Sydney.

*ASCARIS LUMBRICOIDES* can flourish only in communities where human faeces are deposited on the ground. This may be the natural means of disposal, as in primitive peoples, or an economic practice, as in the use of nightsoil on the fields. In China, where this method of fertilizing the soil has its most extensive application, it has been estimated that some 300,000,000 persons play the part of host to this worm with perhaps an annual production of some 18,000 tons of *Ascaris* eggs (Stoll, 1947). Similar methods of enriching the earth in the vegetable gardens of north Germany, assisted by post-war decline in standards of hygiene and a shortage of anthelmintic drugs, have led to a pronounced increase in the incidence of *Ascaris* infestation in that country (Burlingame, 1949; Schlieper and Kalies, 1949).

From the point of view of the parasite, this deposition on the ground is a first and essential step towards the completion of its life cycle. Under suitable conditions of

moisture and temperature the eggs mature in two or three weeks, developing within the thick resistant shell a coiled larval worm. Then, and not till then, are they infective if swallowed. Common means of transference are root vegetables during preparation for cooking, salad vegetables for eating raw, unwashed hands of gardeners, but above all the hands of children.

On arriving in the small intestine the larvae escape from the shell, but do not complete their development in the bowel. Instead they penetrate to the submucosa, enter the portal circulation and pass through the liver to the right side of the heart and thence to the lungs. Here many of them burst into the air vesicles and pass via the bronchioles, bronchi and trachea to the pharynx, to be swallowed a second time; meanwhile they have been undergoing developmental changes. They now proceed to grow into sexually mature worms in the small intestine, where apart from excursions to be mentioned later, they spend the rest of their adult life.

The simultaneous passage of many larvae through the lungs may give rise to a serious bronchopneumonic condition, the so-called *Ascaris* pneumonitis, to which children are particularly prone. A similar condition is seen in young pigs heavily infected with the larvae of the pig *Ascaris*.

The adult worms may cause damage by their numbers and by their tendency to wander from their normal habitat. Massive infestations interfere with nutrition and retard development. The worms may occur as a tangled mass and cause intestinal obstruction or become impacted in the appendix. They are sometimes found free in the peritoneum after perforation of the small bowel, usually at the site of a typhoid or other intestinal ulcer, although some observers consider that the worms themselves may perforate the bowel. Their wandering habits may lead them to the bile passages, with serious results, whilst their entry into the stomach, to be expelled by vomiting, is a common event. Occasionally they enter the glottis and cause laryngeal obstruction. Various other complications are recorded from time to time, so that their presence in the body is at once an unpleasant nuisance and a potential danger.

With such a means of transmission from host to host, involving as it does a period of maturation in the soil, one would imagine that a city like Sydney would be entirely free from locally contracted *Ascaris* infestations. This would be to ignore the facilities for transmission offered by the substandard home in a densely populated area. Here we have narrow, unpaved, relatively sunless backyards, numerous children and poor facilities for personal hygiene. This is to use very restrained terms. Homes have been seen recently where there was no water coming through the reticulation and where for this or some other reason the water-closet was not in use. It needs only one child with *Ascaris* to be introduced into such a home to provide a potential source of infection for the whole street. Once the backyard becomes "seeded" with eggs, it may remain infective for months or possibly years. Visiting children playing on such ground become infected and in turn "seed" their own yards and so establish fresh foci. Such a state of affairs exists in parts of Sydney at the present time.

Recently it was brought to the writers' notice that children infected with round worm were being seen at a hospital which serves such a population. More than a dozen cases had occurred in the period from 1949 to 1951 among children ranging in age from sixteen months to seven years, although isolated cases had been coming under notice since 1945.

During May and June of the present year the writers visited the houses from which these children had come and a number of other houses close to them. Soil samples were collected from the backyards and arrangements were made for obtaining specimens of faeces from the children.

The specimens of faeces were examined microscopically after treatment by the Willis flotation technique (1921). The soil samples were examined by a technique described by Spindler (1929) and used with success by Prior (1948)

in conducting an *Ascaris* survey in the city of Granada in Spain.

The method is as follows.

(i) The soil is collected by sweeping or lightly scraping the surface of the selected area. (ii) The sample is thoroughly mixed and a representative section weighing five to ten grammes is placed in a 50-millilitre centrifuge tube. (iii) Ten millilitres of a 30% solution of antiformalin is added and the specimen is allowed to stand for one hour. It should be stirred frequently with a glass rod to assist in detaching the eggs from soil particles. (iv) The tube is now filled with a solution of sodium dichromate of specific gravity 1.35 (the potassium salt is not sufficiently soluble). It is shaken thoroughly and centrifuged at 1000 revolutions per minute for one or two minutes. (v) The surface film is lifted by means of a small tube (for example, a Wassermann tube) held mouth downwards, and transferred to a slide for examination.

The writers found that small bubbles caused by foaming interfered to some extent with the search for eggs. This could be lessened by the addition of two or three drops of butyl alcohol to the surface of the fluid in the tube before the microscopic preparation was made.

### Results.

Children from houses from which *Ascaris* subjects had reported to hospital for treatment were first examined. In this group there were 25 children, aged from seven months to twelve and a half years. Twelve of them had eggs of *Ascaris lumbricoides* in their stools; ten had eggs of *Trichocephalus trichiurus*, including five infected with both species.

Of the soil samples from the ten backyards of the houses where these children lived, nine contained *Ascaris* eggs in various stages of maturation up to fully embryonated eggs with living larvae. Three samples contained eggs of *Trichocephalus* and one sample *Enterobius* eggs.

In order to ascertain whether there had been any dissemination of *Ascaris* eggs from these yards to neighbouring houses, examinations were made of soil samples and faecal specimens from children from a number of premises on either side. This was carried out in two streets. In the first, all of 12 yards and eight children gave negative results. In the second street one out of eight yards yielded human *Ascaris* eggs and one child from the corresponding house had *Ascaris* eggs in the stool. Sixteen other children from this street gave negative results. Since the house that gave the only positive result was widely separated from an infected yard, direct transference of eggs by surface washings or other mechanical means could not be inferred. At several houses in this group deposits of human faeces were seen in the yards at the time of collection of the soil samples.

In another street of many substandard homes, not far distant from one of the streets where several of the *Ascaris* infections had been found, eight soil samples from as many houses and faecal specimens from nine children were examined. No *Ascaris* eggs were found, but the presence of *Trichocephalus* eggs in the soil of one yard and in two of the faecal specimens indicated that conditions were favourable for transmission, since both these worms have a similar extracorporeal cycle and are transmitted in the same way.

### Discussion.

The findings here recorded confirm reports that *Ascaris lumbricoides* is endemic in parts of Sydney, and further show that transmission is occurring amongst children by the well-known medium of the insanitary backyard. The scope of the investigation has been insufficient to determine the number of foci of infection or to define their limits. If no mention is made of the probable sources of the original worms in the area, it is because of the undesirability at this time of implicating any particular racial group in publicity which might interfere with its assimilation. The findings indicate that the "seeded" areas are at present confined to a relatively few households. These are possibly premises into which the worm was introduced by persons from northern rural areas during the war

years, or which have been contaminated by visiting children from such households. Transmission may have been intensified by the recent exceptionally wet seasons, and fortuitous circumstances may have contributed by bringing more infestations to light. Much more extensive and systematic investigations are needed before conclusions of epidemiological value can be drawn. It is unlikely that the means of transmission indicated by the foregoing findings would ever result in a high overall rate of infestation in the community. Nevertheless it is possible for ascariasis to become a common childhood hazard in Sydney if foci of infection are allowed to become widespread.

For the control of ascariasis under the conditions met with in this survey, the following measures are suggested.

1. Treatment of infested children with the object of preventing further "seeding" of the yards with eggs.
2. Treatment of infected yards to reduce the risk of transmission through soil contamination.

The best way of dealing with a small backyard is to cover it with concrete or asphalt. Two such yards were seen in an otherwise very substandard terrace, and the contrast with the adjoining premises was striking. Small plots of ground can also be treated by digging in the surface layer of soil. Sterilization of the surface by live steam is another temporary measure.

Since the eggs are highly resistant to chemicals, disinfectants in ordinary strengths are useless. Larvae will continue to develop in eggs immersed in 10% formalin solutions.

Instruction in hygiene in schools and in the homes by visiting public health personnel should be part of any campaign. Mothers should be told of the sources of infection and the methods of control.

### Acknowledgements.

This paper is published by permission of the Director-General of Health, Commonwealth of Australia. Domiciliary visits for the collection of specimens were facilitated by officers of the Health Department of the Sydney City Council.

### Summary.

1. The life cycle, means of transmission and chief pathological effects of *Ascaris lumbricoides* are outlined.
2. Results are given of a short investigation into the occurrence of *Ascaris* infestation in an overcrowded part of Sydney.
3. Human *Ascaris* eggs were demonstrated in the soil of 10 out of 11 backyards of houses where children harbouring *Ascaris lumbricoides* were living. Pollution of the ground by young children is thought to be the chief source of new infections in the area.
4. Measures for checking the spread of infection are suggested.

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# A VIRUS ISOLATED FROM A CASE RESEMBLING EPIDEMIC PLEURODYNIA: A PRELIMINARY REPORT.

By D. W. HOWES, B.Sc.,

From the Institute of Medical and Veterinary Science,  
Adelaide,<sup>1</sup> and the Bacteriology Department,  
University of Adelaide.<sup>2</sup>

SINCE the initial isolation of a Coxsackie virus by Dalldorf and Sickles in 1947, a number of reports of the association of these viruses with epidemic pleurodynia have appeared (Curnen *et alii*, 1949; Curnen, 1950; Hopkins, 1950; Findlay and Howard, 1950; Weller *et alii*, 1950; Geffen, 1951). From these reports it is apparent that several serological types are involved.

Following the earlier reports of this association, an attempt was made, in Adelaide, to isolate virus from three patients suspected of having epidemic pleurodynia. Results of tests carried out in suckling mice on pharyngeal washings and faeces from these patients were negative. However, the writer, soon after collecting these specimens, developed a typical attack of the disease, and from his pharyngeal washings a virus with some of the characteristics attributed to "C" viruses was isolated.

## Clinical Record.

### History.

Specimens of pharyngeal washings and faeces from two patients suffering from pleurodynia had been collected by the writer ten to fourteen days before he developed symptoms. These specimens were handled during the next ten days in the laboratory, and in view of an incubation period variously estimated at from two to eight days, it is probable that infection was contracted in the laboratory.

### Symptoms.

The first symptom was severe pain in both eyes on moving them, followed on the next day by general malaise and a severe pulsating headache on exertion. On the third day a temperature of 102° F. was recorded. At that time eyeache was still present, but less severe, together with a persistent slight headache.

On the fourth day, pain was felt in the epigastric region on deep inspiration, the site of pain shifting laterally during the day to the left chest wall. Slight tenderness was felt on pressure over the lower ribs, and pains were felt in the left shoulder.

These symptoms continued on the fifth day with, in addition, slight inspiratory pain on the right side and pains in the right shoulder. The symptoms had abated considerably on the sixth day, and by the seventh no symptoms were present except for a pronounced tendency to develop "stitch" on slight exertion, this persisting on the eighth day. Recovery was complete on the ninth day.

## Experimental Record.

Seven two-day-old suckling mice, inoculated intraperitoneally with pharyngeal washings collected on the fifth day of illness, died from seven to ten days after inoculation. A saline suspension of thigh muscle from these mice, when inoculated intraperitoneally, intramuscularly and intracerebrally into two-day-old mice, produced a relative loss of weight (as compared with that of the litter controls), death in from seven to nine days after inoculation, and paralysis of the hind limbs of two of the mice. Uninoculated litter controls for both first and second passages showed no signs of disease.

The virus nature of the infective agent is indicated by the ability of muscle suspensions to produce disease in mice after passage through gradocol filters ranging from

600 m $\mu$  to 55 m $\mu$  average pore diameter, and the inability of such suspensions to initiate bacterial growth in cooked-meat medium or on sheep's-blood agar incubated aerobically or anaerobically at 37° C. The agent is not affected by penicillin and streptomycin in concentrations of 500 units per millilitre.

Since isolation the virus has been passed serially in suckling mice on eleven occasions, 0.05 millilitre of a 20% bone and muscle suspension of suckling mice producing death in mice aged one to two days at forty-eight to seventy-two hours after intraperitoneal inoculation. Apart from slightly retarded growth, mice show no obvious signs of disease until a few hours before death, when they become weak, the weakness progressing to cyanosis and death. On examination of the mice after death, no macroscopic lesions are detectable. Paralysis has been observed only occasionally in mice receiving concentrated suspensions of virus. Mice receiving dilutions near the infectivity end point show paralysis of the hind limbs more frequently, but this is not a regular occurrence. Paralysis of the fore limbs appears only occasionally. Mice with paralysis may survive for three weeks or more after becoming paralysed, without any lessening of the severity of the paralysis.

Weaned mice, aged three to four weeks, have been found to be susceptible to virus inoculated intraperitoneally, intramuscularly or intracerebrally. The resultant signs of infection are the same irrespective of the route of inoculation. The mice become sick within three to ten days of inoculation and, as a rule, die one to four days later. Typical features are the development of pronounced weakness, hyperaesthesia in the early stages, and the assumption of a hunched position with ruffled fur.

In mice over three months of age the onset is more gradual and the incubation period is longer than in newly-weaned animals. Paralysis has not been observed in weaned mice. No macroscopic lesions have been found in mice aged three to four weeks, but mice older than three months have shown on several occasions a yellow, mottled liver. Microscopically, pancreatitis and myositis have been found in both weaned and suckling mice.

Virus has been demonstrated in thigh muscle, liver, and brain of mice aged three to four weeks, by passage to both suckling and weaned mice; the virus appears to be present to a lower titre in the brain than in the other tissues.

Susceptibility decreases with increase in age, but the change is a gradual one. For the three age groups—one to two days, three to four weeks, and greater than three months—the log LD<sub>50</sub> titres of a muscle-bone suspension of suckling mice were of the order of 7.0, 5.5 and 5.0 respectively—a standard inoculum of 0.05 millilitre given into the peritoneal cavity being used for each group.

Young weaned rats and guinea-pigs have been found to be not susceptible to intraperitoneal and intracerebral inoculation of a 20% muscle suspension.

Specimens of serum from two of the cases have been examined for the presence of neutralizing antibodies, tests being carried out in both suckling and weaned mice. The serum specimens taken from D.W.H. on the fifth and thirty-second days had log neutralization indices in suckling mice of 3.38 and greater than 5.83 respectively. In weaned mice, three to four weeks of age, values of 3.85 and greater than 4.68 were obtained from serum specimens taken on the seventh and thirty-second days respectively. Serum taken eight months after recovery from D.E.L., one of the possible sources of infection for D.W.H., possessed a titre of greater than 6.25 when tested in suckling mice. Unfortunately, an acute phase serum specimen from this patient was not taken.

## Discussion.

While a sufficiently large number of cases of epidemic pleurodynia have not been investigated for adequate evidence to be obtained of the causal association of this virus with the disease, the substantial rise in neutralizing antibodies to the homologous virus, and the demonstration

<sup>1</sup>Work done with the aid of a grant from the National Health and Medical Research Council.

<sup>2</sup>Work done with the aid of a State Government grant through the Poliomyelitis Advisory Committee.

of a high neutralizing titre in another patient who has recovered are suggestive.

In its characteristics as so far determined the virus appears to conform to the properties of the Coxsackie viruses as a group, but its relatively high pathogenicity for weaned mice appears, from the literature, to be a much less common property.

#### Acknowledgements.

I am indebted to Dr. M. C. Fowler for examining sections and to Dr. J. A. R. Miles and Miss N. Atkinson for their suggestions and encouragement.

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## Reports of Cases.

### CORTISONE IN THE TREATMENT OF SECONDARY GLAUCOMA.

By EUNICE WILSON, M.B., B.S., M.Sc., D.O.M.S. (England),  
 Honorary Assistant Ophthalmologist, State Hospital,  
 Lidcombe, and to Rachel Forster Hospital,  
 Sydney,

AND

S. H. SWIFT, M.B., Ch.B., D.R.C.O.G., D.T.M. and H.  
 (London),

Senior Medical Officer, State Hospital, Lidcombe,  
 New South Wales.

On July 2, 1951, a male waterside worker, aged thirty-seven years, was admitted to hospital suffering from severe secondary anaemia, tachycardia, a painful swollen right knee joint and pain in the cervical part of the spine and left shoulder joint. He gave a seven-year history of untreated migratory polyarthritis of major joints.

In February, 1951, on account of severe *pyorrhea alveolaris*, he had 25 teeth extracted in stages, but without any cover therapy. Two weeks later he was forced to give up his work owing to an acute exacerbation of his arthralgia, he lost much weight and finally collapsed during an attack of paroxysmal dyspnoea. He consulted a doctor for the first time and was admitted to hospital.

The grave secondary anaemia, polyarthritis, carditis, subsequent epistaxis, high erythrocytic sedimentation rate and his good response to salicylates were in favour of a diagnosis of rheumatic fever of a low-grade intractable type.

He was given a blood transfusion, iron and salicylates, and his general condition greatly improved. Unfortunately, however, on July 23 he complained of pain and lachrymation in the left eye, of blurred vision and of coloured haloes around lights.

On examination of the eye, the whole conjunctiva was red, the cornea was steamy, the pupil was inactive and the tension was raised. He was given intensive therapy with "Eserine" drops with some symptomatic relief. It was

fortunate that his fundi had been examined three weeks earlier and found to be normal, for this with his acute rheumatism made a diagnosis of secondary glaucoma fairly obvious and the "Eserine" therapy was discontinued.

Homatropine and cocaine drops were inserted, but failed to dilate the pupil. A subconjunctival injection of five minims of mydracaine broke the synechia with some bleeding at the iris margin, but only moderate mydriasis resulted, the cornea remaining oedematous. The cornea was cleared with glycerin for further examination. No keratic precipitates were seen, and there was a mass of exudate on the front of the lens the size of the former small pupil. The iris was oedematous with dilated vessels on its surface. The fundus was not visible. The tension remained high.

The following treatment was commenced. Atropine sulphate drops (1%) were instilled, hot spoon bathing was carried out three times a day, and sulphadiazine was given by mouth. In addition, subconjunctival injections of five minims of mydracaine were used to break down synechia as required, usually daily. Despite this intensive treatment, mydriasis was not maintained and synechia continued to form.

On July 29, one week after the onset of acute secondary glaucoma, a course of "Chloromycetin" was started, beginning with four capsules, followed by two capsules every four hours until August 2, a total of 10.5 grammes being given. This gave great symptomatic relief, the eye looking a little less angry. However, the condition of acute exudative iritis with secondary glaucoma was still present, and an application was made for cortisone on July 31.

Five hundred milligrammes of cortone acetate in 20 millilitres were made available, and administration was commenced on August 1, the dosage being as follows: 100 milligrammes three times on August 3, 75 milligrammes twice on August 4, given intramuscularly. The balance was diluted to one in four in saline and used locally, 0.4 millilitre subconjunctivally on August 6 and 9, and as drops twice a day till August 14, 1951.

After twenty-four hours of cortisone treatment improvement was dramatic. The tension returned to normal, the cornea became bright and clear, the iris resumed its normal pattern, and mydriasis remained effective for the first time since treatment started. However, a view of the fundus was not obtained until August 14, eleven days after cortisone therapy had commenced, and even then it was very blurred, presumably owing to vitreous haze. On August 18, four days after intramuscular injections ceased and when rheumatic pains reappeared in the joints, the eye was quiet, with no glaucoma, no ciliary injection, good mydriasis but still one synechia. The patient could recognize people at a distance of 20 feet. The outline of the disk could be defined on fundus examination, but there was still some vitreous haze.

On September 10 the eye was quiet and visual acuity was 6/6 in both eyes. A clear view of the fundus was obtained and it appeared normal.

#### Discussion.

It is reasonable to expect that a dramatic improvement will occur in acute secondary glaucoma, and also that this should be permanent. The raised tension is due not to a structural fault, as in primary glaucoma, but to the blocking of the drainage of the eye by exudates in the canal of Schlemm and by the oedematous iris bulging forwards to occlude the angle of the anterior chamber through which drainage takes place.

According to Armstrong and Irons (1951), the effects of cortisone are to reduce cellular exudation, to reduce the permeability of capillaries to proteins in regions of inflammation, and to lessen the intense fibrotic reaction in the course of healing. If cortisone can do these things, then it can remove the cause of secondary glaucoma and allow the drugs which are used in the treatment of the underlying iritis to do their work. Lavery *et alii* (1951) state that "if ocular inflammatory reaction can be kept under control while the basic cause is being dealt with, or until it ceases to operate, permanent damage to the eyes may be

avoided". In this case the drugs for treating the basic cause were atropine and "Chloromycetin", but until the secondary glaucoma was relieved by cortisone they were ineffective.

Similar success in the treatment of acute secondary glaucoma by cortisone is reported by Blake *et alii* (1950) and by Olson *et alii* (1950 and 1951), while failures were reported by Gordon and McLean (1950) in a post-operative case, and by Blake *et alii* (1950) in a case of raised tension following chronic uveitis. These two failures are not strictly comparable with the case being reported.

This case is interesting, in that with the withdrawal of cortisone the joint pains returned but the iritis continued to decrease, for it is a self-limiting condition, and as soon as the cortisone started the healing chain of events it continued to a satisfactory conclusion.

#### Summary.

A patient suffering from acute rheumatic fever of a low-grade intractable type, with severe anaemia, carditis and polyarthritis, who developed acute secondary glaucoma due to acute iritis while in hospital, was treated with cortisone.

The secondary glaucoma and iritis were cured, but there was only a temporary remission of rheumatism during the period of cortisone therapy.

The patient exhibited the usual response. His arthralgia left him and he remarked on his sense of well-being. His erythrocyte sedimentation rate fell from 80 to 59 millimetres in one hour during cortisone therapy, but rose to 90 millimetres in the following week.

#### Acknowledgements.

We are indebted to Dr. E. S. Morris, the Director of Public Health, New South Wales, and to Dr. E. J. Brooks, the Medical Superintendent of the State Hospital, Lidcombe, for permission to publish this article and for making the cortisone available.

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## Reviews.

### THE PROBLEMS OF JUNIORS.

GEORGE H. PUMPHREY, the headmaster of a school at Dover, has written a book entitled "Juniors" to explain to parents and teachers the main problems which arise during the upbringing of children between the ages of seven and eleven.<sup>1</sup> The most striking thing about this book is the type of illustration. They have been selected, amongst other things, to depict the expressions on the faces of children while receiving instruction. For instance, one illustration with the legend "Absorbed Juniors watching a

<sup>1</sup>"Juniors: A Book for Junior School Parent-Teacher Groups", by George H. Pumphrey, with a foreword by Sir Cyril Burt, D.Litt., D.Sc., LL.D.; 1950. Edinburgh: E. and S. Livingstone, Limited. 7½" x 5", pp. 186, with some illustrations. Price: 8s. 6d.

classroom play" is reproduced in order to reveal the variety of expression on the faces of some thirty youngsters and it is remarkable. Particular attention is given to modelling and other forms of handiwork, as well as to games based on work the children will perform when grown up, such as shopping. A number of appendices show the amount of work the author has put into his collection of factual material, such as preference for main school subjects, things children like doing out of school, games without adult interference, pocket money and how it is spent, reading habits, lists of things bought by children as presents, comics and their relative popularity, outside organizations to which children belong; there is a concluding bibliography. This is not a book on sex education, although that subject is dealt with, as also is religious instruction, the advice given being sound and practical. One chapter on "Learning by Doing" contains advice on the child's drawing, singing, dancing, acting and general aesthetic development. The book is full of sound advice and suggestion for the conscientious parent as well as for the teacher.

### REGIONAL ANATOMY.

PROFESSOR T. B. JOHNSTON'S "Synopsis of Regional Anatomy" appears in its seventh edition, three years after its sixth.<sup>1</sup> It covers adequately and clearly the essentials for the student within such a small compass that it holds out hope to the student of his acquiring a coherent grasp of the subject, hope which he may have lost while contemplating the great mass of information in the larger text-books.

Five drawings illustrating surface anatomy and sixteen skidagrams have been added in the present edition to the simple line drawings of the central nervous system.

### A NEW BOOK ON DIABETES.

PRIOR to World War II there were really only two text-books on diabetes, "Joslin" from America and "Lawrence" from Britain, each highly characteristic of its author and country in its treatment of the subject; but latterly a series of manuals by John, Colwell and others has appeared. The latest of these is one entitled "Diabetes Mellitus: Principles and Treatment", by Garfield G. Duncan,<sup>2</sup> and the best of its family, because of its directness, its simplicity and particularly its practical virtue. Concise paragraphing, short chapters, a sufficiency of illustrations and a minimum of statistics combine to assist a grateful reader. The book is written for the physician only and is not, like many others, a fruitless attempt to combine information for both doctor and patient under one cover. Many excellent clinical aphorisms appear in italics, and bespeak a long experience of this subject. Here are two such correctives to traditional book teaching: "Every untreated overweight diabetic has a mild diabetes despite the degree of hyperglycemia found", and "Obesity is the most important precipitating cause of diabetes, occurring in 70-80% of patients whose diabetes first manifests itself in adult life". The author is at some pains to keep alive the importance of Calorie control in treatment. This vital concept was originally provided with experimental proof by Dr. F. M. Allen, who, in the foreword, boldly challenges anyone to detect signs of premature cardiovascular degeneration in any of his patients who have been well controlled by insulin and in a good nutritional state.

Some of Duncan's clinical findings in diabetes do not tally with those in this country. Two of the three great difficulties in diabetic therapy are well presented—namely, the interpretation of the glucose tolerance test and which insulin to use; but the third, insulin resistance, scarcely receives a mention. The most exciting aspect of modern diabetes, the prediabetic state, is also omitted. The chapters on incidence, coma and heredity are all adequate, but nowhere is much said upon the psychological aspects of the disorder. However, the two main ingredients of a text

<sup>1</sup>"A Synopsis of Regional Anatomy", by T. B. Johnston, C.B.E., M.D.; Seventh Edition; 1951. London: J. and A. Churchill, Limited. 8" x 6½", pp. 466, with 20 plates and 17 text-figures. Price: 22s. 6d.

<sup>2</sup>"Diabetes Mellitus: Principles and Treatment", by Garfield G. Duncan, M.D.; 1951. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" x 6½", pp. 310, with 32 illustrations and figures. Price: 54s. 9d.

on diabetes, the sections dealing with food and insulin, are presented in a clear and practical manner.

The author is the first in our experience to emphasize the axiom that the uniformity of intake of food and insulin from day to day is as important in therapy as quality and quantity; changes in the total Calories have a more far-reaching effect than have changes in the allowance of carbohydrate. His method of diet prescription is similar to that advocated by the American Diabetic Association, that is, liberal protein, carbohydrate of almost normal amounts (except in obesity) and a low fat ration. In fact, the fat ration is so low as to produce a risk of inadequacy of fat-soluble vitamins and of unpalatability. At last, here is a writer who has the courage and common sense to discuss dietetics in terms of pounds instead of kilograms. Full lists of standardized diets and the use of food exchanges are set out in the text. The section dealing with the choice of an insulin, or insulins, is very complete and includes advice concerning NPH insulin, which is not yet available in this country. The directions could be more didactic for the beginner.

Another subject which is well covered is that of diabetic neuropathy; and reference is made to the involvement of the autonomic nervous system and to relief by vitamin B<sub>12</sub>. Principles governing the management of acute complications and surgical operations in diabetics are clearly enumerated. The chapter on diabetic coma embodies the accepted procedures, concisely discussed. Reference is made to the value of "salty broth" by mouth as a first-aid measure. The weakest section concerns diabetic pregnancy. However, as a practical and up-to-date manual, this is the best of a large series, and should be available in every clinic and to every physician interested in diabetics. It is rather too detailed for the general practitioner.

#### A LIFE OF SIR HENRY THOMPSON.

As a gifted author Dr. Zachary Cope needs no introduction to the medical profession, and it is gratifying to note that he has now turned his attention to the colourful and varied career of a surgeon whose span of life practically coincided with that of the late Queen Victoria. His latest book, "The Versatile Victorian",<sup>1</sup> is a short, lucid and altogether delightful sketch of the life and times of Sir Henry Thompson, Bt., who, besides reaching an eminent position as a surgeon specialist, was able to find opportunities to develop his exceptional talents as a courtier, brilliant conversationalist, writer and artist.

Some time after Dr. Cope had decided to collect material for this biography, he found that Sir Henry towards the end of his days had actually written his reminiscences, stipulating in his will that they should not be published until several years after his death. Fortunately, the manuscript was discovered to be in the possession of one of his descendants; and it proved so illuminating that Dr. Cope has used it extensively to give the reader a more vivid and authentic picture of the man himself, his many intimate and distinguished friends, and his proper place in the surgical and social world of a grand epoch.

There can be no doubt that Thompson led an extremely full, varied and interesting life, despite the earlier restrictions upon his liberty as a dutiful member of an austere and somewhat puritanical Nonconformist household. A youthful ambition to enter the medical profession was frustrated until he reached the age of twenty-seven, when his father at last consented to release him from the family business and allow him to enrol as a medical student at University College Hospital, London.

As the story unfolds we see Thompson always striving to attain perfection in his various pursuits, and he seemed to achieve unvarying success by dint of sheer perspicacity, untiring industry and scrupulous attention to detail. At the age of twenty-one he must have been one of the earliest amateur photographers in Britain, as he learnt the art of taking small-sized portraits and developing them in his own dark room only two years after Fox Talbot and Daguerre had made their new process a practical proposition. But Dr. Cope can hardly be correct in the statement that "in 1839 Daguerre and Niepce devised the sensitive plate which became known as the daguerrotype", as Nicéphore de Niepce died in 1833. Later, Thompson was to become a pioneer

urological surgeon, a painter whose pictures were accepted by the Royal Academy, a successful essayist and writer, and, towards the end of his life, one of the first motorists to take the road in Great Britain.

There are salutary lessons to be learnt from following the paths which led to the multifarious achievements of this cultured, egotistical and persevering product of the Victorian Age as they are presented to us in this entertaining book.

### Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Treatment of Varicose Veins and Their Complications", by Stanley Rivlin, M.R.C.S., L.R.C.P.; 1951. London: William Heinemann (Medical Books), Limited. 7½" x 5", pp. 64, with 5 plates and 25 text figures. Price: 10s. 6d.

This work was awarded the Hunterian Gold Medal for 1950.

"Orthopaedic Nursing", by Mary Powell, S.R.N., M.C.S.P., Orthopaedic Nursing Certificate, with a foreword by Sir Reginald Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S.; 1951. Edinburgh: E. and S. Livingstone, Limited. 9" x 6", pp. 412, with 209 illustrations. Price: 25s.

Written primarily for nurses and physiotherapists working and training in orthopaedic hospitals.

"Exercises after Childbirth", by Gertrude Behn, M.C.P.S., with a foreword by Linton Snaith, M.D., M.S., F.R.C.S., F.R.C.O.G.; 1951. Edinburgh: E. and S. Livingstone, Limited. 9" x 6", pp. 32, with 36 illustrations. Price: 3s.

The exercises described were devised for patients at the Newcastle General Hospital (England).

"The Mode of Action of Anaesthetics", by T. A. B. Harris, M.B., B.S., D.A., F.F.A.R.C.S.; 1951. Edinburgh: E. and S. Livingstone, Limited. 8½" x 6", pp. 780, with 22 text figures. Price: 42s.

An attempt to present the subject as applied to man in a complete story—based on 28 lectures given to army candidates for grading as anaesthetists.

"The Quantitation of Mixtures of Hemoglobin Derivatives by Photoelectric Spectrophotometry", by Francis T. Hunter, A.M., M.D.; 1951. Springfield, Illinois: Charles C. Thomas, Oxford: Blackwell Scientific Publications. 9½" x 6½", pp. 246, with 6 figures and 42 charts. Price: 63s.

A handbook dealing with fundamentals.

"Leaves from a Doctor's Life", by Philip Pantton; 1951. London: William Heinemann (Medical Books), Limited. 8½" x 6", pp. 240, with nine illustrations. Price: 22s. 6d.

The story of a varied and colourful life.

"The Biochemical Approach to Biological Organization", by Ernest Baldwin; 1951. London: H. K. Lewis and Company, Limited. 10½" x 6½", pp. 20. Price: 3s. 6d.

An inaugural lecture delivered at University College, London, on May 31, 1950.

"Chance and Design in Physiological Research", by G. L. Brown; 1951. London: H. K. Lewis and Company, Limited. 10½" x 6½", pp. 14. Price: 3s.

An inaugural lecture delivered at University College, London, on December 5, 1949.

"The Pharmacologic Principles of Medical Practice: A Textbook on Pharmacology and Therapeutics for Medical Students, Physicians, and the Members of the Professions Allied to Medicine", by John C. Krantz, Jr., and C. Jelleff Carr; Second Edition; 1951. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9½" x 6½", pp. 1134, with 95 illustrations, a few being in colour. Price: £5 7s. 6d.

A presentation of "the pharmacodynamic and pharmacotherapeutic actions of drugs as they are used in the treatment and cure of disease".

<sup>1</sup> "The Versatile Victorian: Being the Life of Sir Henry Thompson, Bt., 1820-1904", by Zachary Cope, M.D.; 1951. London: Harvey and Blythe, Limited. 9" x 6", pp. 188, with nine illustrations. Price: 12s. 6d.

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## PROFESSIONAL FREEDOM AND PROFESSIONAL RESPONSIBILITY.

PROFESSIONAL FREEDOM is something which all medical men and women prize—it is probably their most vaunted possession—and it is a live subject nowadays when the freedom of people in many walks of life is threatened and sometimes taken from them. If medical practitioners were asked to say what they meant by professional freedom most of them would no doubt say that they wished to be able to treat their patients to the best of their ability, in accordance with their knowledge of the science and art of medicine and in conformity with their insight into the patient's mentality and general conditions of life. We in Australia have had some experience of the way in which efforts may be made to impose on doctors and on their patients conditions calculated to limit the freedom of the former and to be detrimental to the interests and welfare of the latter. During recent years the question of professional freedom has become much more burning and urgent in Great Britain than it has so far been in this part of the world. It is not, therefore, to be wondered at that T. F. Fox, Editor of *The Lancet*, chose professional freedom as the subject for his Croonian Lectures in May of this year. A lengthy abstract of these lectures appears in *The Lancet* of July 21 and 28, 1951. These two lectures must be regarded as among the most important contributions to British literature of medicine during recent years. At the outset Fox points out that we have to face the fact that if present trends continue, most people in nearly all the professions will soon be working in services directly or indirectly provided by central or local authorities. He quotes from Lewis and Maude's book "The English Middle Classes", in which it is held that there are six classes of profession—at one end those in which all members are employed full time by public authorities, and at the other

end a little group of callings in which public employment is very small and direct State regulation very slight. Lewis and Maude state that "the number of professions in which public authorities neither directly regulate practice nor possess a substantial influence as potential employers proves on examination to be startlingly small". This small group, they point out, comprises only dissenting clergy, senior trade-union officials, journalists, authors, visual artists, actors and perhaps university teachers. "Even more startling" is the precariousness of the freedom which most of these appear to possess. One example is the way in which the livelihood of journalists and authors depends on the amount of paper allotted by those in control for the production of books and journals. In a discussion on freedom and the spirit of man in these columns three or four years ago it was pointed out that man may be restricted in all kinds of ways—he may suffer ignominy, torture and death—and still be spiritually free. These considerations suggest a general discussion on freedom, its meaning and the possibility of its realization; but that must remain for another occasion. At the moment we shall be content to see where Fox leads us in his lectures.

Fox quotes Herbert Spencer's statement that "every man should be free to do what he wills, provided he infringes not the equal freedom of other men". He adds that when one comes to look at it, the proviso is disturbing; for, in our crowded society, if one does what one likes, and especially if one does not do what one does not like, it is all too easy to injure people. "Indeed, a moment's reflection shows that complete freedom is right outside human experience, and that membership of a profession necessarily involves some additional loss of personal liberty." The limitations of freedom imposed on the qualified doctor are ethical rather than technical, and are enforced by conscience and custom rather than by outside sanctions. On the one hand, Fox writes, the unwritten code of conduct is set so high that no one could observe it all the time—at its highest the code asks the doctor to be selfless in rendering service whenever and wherever it is needed. On the other hand, the minimum standard acceptable to the State is so readily attainable that, having once satisfied the examiners in medicine, surgery and midwifery, most doctors have no difficulty in retaining their right to practise for the rest of their lives. A doctor practises under official auspices, yet according to his own judgement. Fox reminds us that no doctor's name can be removed from the medical register merely because he lacks technical competence or because he adopts some theory of medicine that other doctors look on as foolish or worse. The only offences for which a qualified practitioner can be forbidden to practise are ethical or moral offences, and these must either have led to conviction in a court of law or be serious enough for the registering statutory body to regard them as infamous conduct in a professional respect. History tells us, and we all know, that the path of the reformer or of the innovator of a special form of treatment, however well conceived, may be one of difficulty, of misunderstanding, of misrepresentation and even of obloquy. Orthodoxy dies hard. The average man believes in the following of a routine. Fox points out that in such a business as the navigation of a ship the essential element from the point of view of public safety is the following of a routine. In medicine,

he adds, the essential element on the other hand is the exercise of judgement, often where its validity is a matter of opinion. We know that in actual practice there are, from the medico-legal point of view, certain routine measures which every wise practitioner will adopt. But we are not concerned with these at the moment, but with general control. In this regard it will be good for the virility of medicine and the welfare of the State if the State remains content, in Fox's words, and "merely controls the conditions under which people are admitted to, and remain in, membership" of the profession and does not make great numbers of rules for members to keep.

One of the best points made by Fox follows his statement that freedom is something that can be obtained only in a limited field by continually clearing away brambles and obstructions. When the medical profession demands freedom, Fox asks, "freedom for what?" His answer is "freedom to serve". This was the conclusion in our discussion in 1947—"freedom will express itself in service". Fox refers to the practitioner as a physician "fully responsible to whatever patient is before him and for the moment in his care". He quotes Bernard Shaw: "Liberty means responsibility. That is why most men dread it." He adds: "It is because liberty alone permits responsibility that our profession must retain it, or, as some would say, regain it." This is the lesson which we would draw from Fox's Croonian Lectures. It is a lesson which needs to be learned by the young members of the profession and learned over again by many of their elders. These are days in which men in all walks of life look for shorter and still shorter hours of work, in which they demand as much ease and comfort as they can get, and in which they expect or at least hope to have every amenity and labour-saving device. Into the wisdom of these views and aspirations we need not enter at the moment, except to remind ourselves that men are interdependent—"no man liveth unto himself". Herbert Spencer's dictum, already mentioned, comes to mind. We cannot be free in our profession if in our efforts to that end we take freedom from other people. If we do this we are no longer members of a profession, but tradesmen. This is not to cast aspersions at, or to look down on, tradesmen. A tradesman, by unselfishness, by devotion to duty and by a display of the desire to serve his fellows, can show all the qualities demanded of a professional man, just as surely as a member of the professions will debase his calling by unworthy actions. From time to time authenticated stories are told of resident medical officers who counter instructions by their senior "honorarys" to do work at stated hours for an acutely ill patient recently operated on by the statement that they go off duty at such and such a time before the service will be due. Or we hear of an aspirant to surgical experience turning down the chance of a lifetime to become "off-sider" in private practice to a senior surgeon with the remark that "I do not work at night or the week-ends". Or—and this is all too common—men leave their practices at week-ends and patients have no means of finding out who is supposed to be "on duty" for the practitioner. Fox remarked that the unwritten code of conduct was so high that no one could observe it all the time. The code of conduct for many does not seem to exist. Disease, as the late Thomas Fiaschl, of Sydney, taught all his house surgeons, does indeed know no holiday.

In thinking of his own comfort, a practitioner is apt to forget this, and it is all too easy for us all to forget also that patients are men of like passions, feelings and sufferings with ourselves. When young people make up their minds to become doctors they know what kind of life they will have to lead and that they will have to live mostly for other people. If they have only mercenary motives it would be much better for them for all time if they had never thought of medicine. Devotion to the ideals of medicine is something which can never be secured by control of any kind. The responsibility which goes with freedom must indeed be accepted and even sought if medicine is to retain its virility and be effective.

## Current Comment.

### MEGALOBlastic ANÆMIA OF PREGNANCY.

MORE attention could be paid with advantage to the megaloblastic anæmia of pregnancy and the puerperium, for there is perhaps an impression that it rarely occurs in temperate climates in countries adopting the European standard of living. R. B. Thompson and C. C. Ungley have published a series of 45 cases studied during the past seventeen years.<sup>1</sup> In 33 instances the diagnosis was made by the finding of megaloblasts in the marrow or the blood, and in the remainder by the presumptive but satisfactory evidence of other clinical and laboratory findings, together with a specific response to liver or yeast. It should be noted that the mean ages of Thompson and Ungley's patients was thirty-one years, whereas a random series of 45 women with Addisonian pernicious anæmia had a mean age of fifty-five years. The distribution of the disease by the number of pregnancies suggests that it is more prone to occur after multiple pregnancies, but one-quarter of Thompson and Ungley's cases occurred after the first pregnancy. No previous history of anæmia with previous pregnancies was obtained from the patients. The time of onset was late during the period of gestation, or during the puerperium, but it is noteworthy that in 11 out of the 45 cases symptoms were observed before the fifth month. Thompson and Ungley saw only seven patients before delivery, and the majority had already been admitted to a medical clinic for treatment. It is important that many of these patients were critically ill when examined, and the presence of fever accompanying some intercurrent infection, such as one affecting the urinary tract, the chest or the pelvis, caused some confusion in diagnosis. The chief clinical features were the usual physical concomitants of severe anæmia, but several features were fairly characteristic. These were headache, which was common and relieved satisfactorily only by successful treatment for the blood disorder, soreness of the tongue, and dysphagia. Some atrophy of the tongue was seen in a few patients, and dysphagia, though not common, was sometimes associated with a sore tongue. One patient developed steatorrhœa at a later date. Enlargement of the spleen was infrequent, and enlargement of the liver, present in only four patients, occurred as part of a general congestive circulatory failure. Circulatory symptoms were common, though usually they were not severe. Hemorrhages were present in the retina in thirteen patients, all of whom had low red cell counts (less than one million cells per cubic millimetre). The morphology of the blood cells was very similar to that seen in Addisonian anæmia, though with not so striking a degree of variation in size and shape of the red cells. Megaloblasts were found in only three instances in the blood, but the observation was, of course, convincing and significant. Analysis was carried out of the gastric contents of 41 women in the series; in

<sup>1</sup> *The Quarterly Journal of Medicine*, April, 1951.

nine cases only was hydrochloric acid absent. The numbers are not sufficient to enable an opinion to be expressed whether this proportion is unusual, but achlorhydria was certainly not a feature of the disease. Bone marrow examination showed a similar picture to that seen in Addisonian anaemia. The possible presence of evidence of blood cell destruction was investigated, a point of importance in the aetiology, but only in three cases was such evidence obtained. In these the evidence was based on estimation of the survival rate of red cells after transfusion. Of much greater interest is the question of the dietary habits of the patients before the onset of this anaemia. In 11 out of the 45 cases the patients' diet was poor, owing to dislikes of certain foods, or upsets in digestion or appetite, and a clear relationship in regard to the time of onset was established; this, of course, does not prove the aetiological importance of the diet, especially as the dietary of these patients was not apparently worse than that of numbers of other women who showed no sign of anaemia. The aetiology remains obscure, though the nature of the deficiency is elucidated somewhat by the response following the administration of haemopoietic substances. Thompson and Ungley tried refined and crude liver extract, raw liver, vitamin B<sub>12</sub>, folic acid and yeast extract; as the result of their observations they conclude that none of their patients responded to the anti-pernicious anaemia principle, whereas they had good results with folic acid, raw liver (possibly also due to folic acid) and yeast. The response to yeast cannot be explained. One very satisfactory feature of the work was that there were no deaths from this potentially lethal disease, despite the severe nature of the illness in some cases. Transfusion was given to nearly half the patients, but there was no special response, except one of a temporary nature.

#### LOCAL APPLICATION OF CHLORAMPHENICOL.

It is curious that despite the extensive use that has been made of chloramphenicol ("Chloromycetin") and the great promise that it has shown, little or nothing has been published about its local application. This makes particularly worthy of note a preliminary communication by V. M. Coppleston, of Sydney,<sup>1</sup> in which he states that recent clinical trials of the local application of chloramphenicol suggest that in infected wounds, ulcers, burns and even wounds infected by gas-forming organisms local application is superior to administration by mouth. The first case in which it was used was one of wound infection after removal of a gangrenous appendix; other measures having failed, a striking and rapid improvement followed application of chloramphenicol to the wound. Then chloramphenicol was applied to a perineal wound infected with gas-forming organisms, following extensive abdomino-perineal resection of the rectum; again the response was apparently dramatic. Since then, Coppleston states, chloramphenicol has been directly applied by irrigation, by surface application of powder and by ointment in a wide variety of cases, including burns and bedsores. In several instances local application of pure powder in combination with other treatment, such as injection and bandaging, has resulted in unusually rapid healing of chronic leg ulcers. Pure powder has been used prophylactically in wounds at the time of operations in which silk has been buried, and it has been used as a post-operative dressing for anal fistulae, and in other ways. In all these cases, Coppleston states, local application has led to great clinical improvement. It also appears to stimulate healing. The chloramphenicol lotion used to irrigate wounds and cavities contained two to four capsules (500 to 1000 milligrammes) to five millilitres of distilled water. The powder has been used in pure form on small ulcers or in operation wounds, or as a dusting powder (500 to 1000 milligrammes to one ounce of *Pulvis Amyli* and zinc oxide, equal parts, or to one ounce of lactose) for surface wounds or larger areas. An ointment also has been used containing 500 to 1000

milligrammes in one ounce of plain petroleum jelly. No doubt further experience will suggest refinements in method of application of this promising form of antibiotic therapy.

#### CAMPAIGN AGAINST CANCER IN TASMANIA.

A CAMPAIGN against cancer has been initiated by the Tasmanian Minister for Health, the Honourable R. J. D. Turnbull, who is himself a medical practitioner. The active cooperation of the medical profession of the State is being sought in this campaign, and as one of the methods of furthering it a bulletin entitled *Carcinoma Bulletin* has been brought into being. The first issue, dated September, 1951, has been received. *Carcinoma Bulletin*, which is to be issued free to all medical practitioners in Tasmania by authority of the Tasmanian Department of Public Health, is edited by Dr. C. Craig, of the Launceston General Hospital. In a foreword to the first issue, the Minister for Health states that Dr. Ida Birchall, of Launceston, and Dr. W. W. Wilson, of Hobart, will act as gynaecological sub-editors, and Dr. A. L. Stephenson and Dr. L. W. Knight, of Hobart, will act as general sub-editors. The radiotherapeutic adviser is Dr. W. P. Holman, of Launceston. The members of the medical staffs of the hospitals of Tasmania are invited to act as editorial committees. The Minister explains that *Carcinoma Bulletin* will be issued at intervals as material becomes available. Its atmosphere is to be kept informal, "so that contributors may express themselves freely just as they would at a clinical meeting". The intention is to publish summaries of good articles on cancer, to assist anyone working on special aspects of cancer and to answer questions after reference to authoritative sources. Above all, the hope is expressed that doctors will describe their own experiences with cancer, whether they are happy or otherwise. The editorial in the first issue of *Carcinoma Bulletin* foreshadows some of the types of articles that it is hoped to publish in the future, and a suggestion is made for the development of the surgical treatment of cancer by means of teamwork among Tasmanian surgeons. In a brief article Dr. B. M. Carruthers, Director of Hospital and Medical Services, outlines the plan for cancer detection clinics already being implemented in Hobart and Launceston. The rest of the bulletin is taken up with a report by C. Craig of two cases of bleeding *per rectum*, published because they demonstrate one method of onset of carcinoma of the colon, a summary of an article on discharge from the nipple, which appeared in *Annals of Surgery*, and a copy of the form of examination for use by cancer-detection clinics and private practitioners. The bulletin is quite pleasingly produced. It is to be hoped that it will fulfil the purpose for which it has been brought into being and will help the medical practitioners of Tasmania to contribute with increased efficiency to a campaign that must have the support of all people of goodwill.

#### THE ADRENAL GLANDS.

ADVANCING knowledge of the adrenal glands has affected many basic concepts of physiology and pathology, but the average medical reader finds it difficult to keep up with the subject. The plethora of literature on ACTH and cortisone is especially confusing. The paper by K. S. Harrison published in our last issue was a valuable summary of current ideas and warrants careful study. More detailed though not exhaustive information on the subject will be found in a symposium on the adrenal glands in *The American Journal of Medicine* of May, 1951. Eight papers by authoritative authors deal with the chemistry of adrenal steroids, regulation of the secretory activity of the adrenal cortex, the general adaptation syndrome, the adrenal cortex and intermediary metabolism, cortisone and ACTH, adrenal insufficiency, hyperadrenocorticism, and adrenal medullary function. The symposium is its own commendation.

<sup>1</sup> *The Lancet*, July 14, 1951.

## Abstracts from Medical Literature.

### BACTERIOLOGY AND IMMUNOLOGY.

#### Chemical Studies in Host-Virus Interactions.

S. S. COHEN AND RACHEL ARBOGAST (*The Journal of Experimental Medicine*, June, 1950) have continued their chemical studies in host-virus interactions with immunochemical studies on the purity of concentrates of various bacterial viruses prepared by differential centrifugation procedures. They worked with three strains of *Escherichia coli* and their corresponding bacteriophages. They made antisera to the host organism in rabbits. After lysis of the bacteria grown for a long time in agar, phosphorus other than that contained in desoxyribonucleic acids would be found in concentrates, and these reacted to the antisera, precipitating non-nucleic acid phosphorus but not altering the virus activity or the desoxyribonucleic acid. After this treatment, the viruses were free of phosphorus other than that in desoxyribonucleic acid, so that this antiserum precipitation purified the virus of substances presumably derived from the host cells. The authors append a discussion of the known facts relating to the desoxyribonucleic acid content of the genetical units of bacterial viruses.

#### Immunological Reactions of Coxsackie Viruses.

JOSEPH L. MELNICK AND NADA LEDINKO (*The Journal of Experimental Medicine*, November, 1950) began a study of immunological reactions of Coxsackie virus by elaborating the technique and application of the virus neutralization test. Their viruses were preserved as muscle-bone suspensions of ground infected mouse carcass maintained at  $-20^{\circ}\text{C}$ . Antisera were prepared in monkeys, the cynomolgus type producing satisfactory sera. Test sera were obtained in pairs wherever possible and titrated in baby mice. Mixtures of virus and antiserum and virus and unknown serum were inoculated after standing for varying periods of time, usually one hour at room temperature, and the mice were observed for ten to fourteen days. Seven types of the virus have been identified by this method. It was shown that neutralizing antibodies appear soon after the onset of illness, increase in titre up to three months, and may persist for two years. Neutralizing antibody can be detected amongst the normal population. During the study, several laboratory infections took place; the subjects showed antibody response for the infecting virus and closely allied strains. Of a group of serum specimens from children in a town where poliomyelitis was epidemic a large number contained neutralizing antibodies to Coxsackie virus.

LISBETH M. KRAFT AND J. L. MELNICK (*ibidem*) continued the work with a study of the complement-fixation test. Antigens were prepared from suspensions of infected animals made in the Waring blender, treated with protamine sulphate and then concentrated. Com-

plement-fixation tests were performed by Kolmer's method, and a trial was also made of the plate method of Fulton and Dumbell. In one group of viruses the complement-fixing antibody produced was of relatively high titre; in the others it was lower. Six groups of viruses could be distinguished.

J. L. MELNICK, N. A. CLARKE AND L. M. KRAFT (*ibidem*) studied cross protection in infant mice born of vaccinated mothers, and the transfer of immunity through the milk. They state that although newborn mice are highly susceptible to infection, in a matter of days they develop a natural resistance to the disease. Therefore baby mice born of mothers vaccinated with a single strain of virus were challenged with a different strain; others of non-vaccinated mothers were challenged with the same type. In each instance the infant mice succumbed. A third group of infant mice from vaccinated mothers were challenged with the same virus as that used on the mother. These survived. Thus evidence was obtained from these groups that immunity is type specific, is conferred through milk or colostrum, and endures for the period of lactation and suckling.

#### Serological Studies with Herpes Simplex Virus.

MARGARET L. HAYWARD (*The British Journal of Experimental Pathology*, December, 1949) has made serological studies with herpes simplex virus using the complement-fixation technique. Antigen was prepared from chorio-allantoic membranes of chick embryos, or from allantoic or amniotic fluids. Specimens of immune serum were obtained from human patients who had yielded the original virus, or by immunization of rabbits or guinea-pigs; these were inactivated by being kept at  $56^{\circ}\text{C}$ . for thirty minutes, and this was followed by overnight fixation at  $4^{\circ}\text{C}$ . Tests with human immune serum showed the antigen to be active up to a dilution of 1:64. Efforts were made to fractionate the antigen, and it was found that the major portion of the complement-fixing antigen was in the supernatant fluid from extracts of chorio-allantoic membranes centrifuged at high speed. It was partially destroyed by heating to  $56^{\circ}\text{C}$ . for one hour, but traces remained even after boiling for five minutes. Out of 40 specimens of serum sent for Wassermann tests, the complement-fixation with herpes antigens showed reaction with high dilution in 33; the other seven were entirely without reaction. No record is given of virus neutralization tests, but mention is made of good correlation in the discussion of results.

#### Newly Isolated Human Encephalitis Virus.

D. G. FF. EDWARD (*The British Journal of Experimental Pathology*, August, 1950) has studied the relationship of a newly isolated human encephalitis virus to louping-ill virus. The human strain was isolated in Czecho-Slovakia during the course of two small outbreaks. It appeared to be spread by ticks, and was found to be pathogenic for mice; contact between mice spread the disease. By means of serological methods and protection tests, the virus was compared with

louping-ill virus and a strain of Russian spring-summer encephalitis. Immune sera against louping-ill and Czech viruses neutralized all three viruses, Czech antisera fixed complement in the presence of all viruses, but louping-ill antisera failed to fix complement with Czech virus. Vaccination of mice with any virus protected against the intraperitoneal inoculation of the other two; but if the intracerebral route was used, no protection could be shown. The three viruses appeared to be closely related, and the differences found were of an order commonly seen in different members of a single group of viruses.

#### Placental Transmission of Antibodies.

SHELDON G. COHEN (*The Journal of Infectious Diseases*, November-December, 1950) has studied the placental transmission of antibodies and serum  $\gamma$  globulins. He states that antitoxins against diphtheria and tetanus are known to pass the barrier; also certain immune agglutinins, complement-fixing antibodies and iso-agglutinins determining blood groups. The present investigation was carried out in pregnant rabbits; the method was to inject various globulins into the rabbit near term, and to test the concentration of these substances in the mother and in fetuses obtained by Caesarean section after the test substance had been circulating for varying periods of time. The tests used were precipitin tests against previously prepared antisera. When human  $\alpha$  globulin or bovine globulin was injected into the mother, it disappeared fairly rapidly from the circulation. In the fetus it did not appear until some ten hours after injection into the mother, and equality was attained only after some one hundred and twenty hours. If homologous rabbit antiserum was injected into the mother, it appeared within one hour in the fetus, and in four hours the titres in mother and fetus were equal. The author comments that the heterologous protein was delayed in its passage through the placenta, while that from the same species was rapidly equalized; that the reason for this is not apparent. He discusses various possible factors which may influence it.

#### Sterilization with Ethylene Oxide.

A. T. WILSON AND PAULINE BRUNO (*The Journal of Experimental Medicine*, May, 1950) have inquired into the possibility of replacing heat or filtration by ethylene oxide in the sterilization of bacteriological media and other fluids. The substance could be obtained in liquid form and needed to be kept chilled; it was added at low temperature to the substance to be sterilized, well mixed and allowed to stand in a  $37^{\circ}\text{C}$ . incubator for twenty-four hours, and after this time the solution was sterile. Samples of broth, milk and other media were artificially infected with known bacteria and treated and observed for seven days. No growth took place in any medium treated with 1% solution of ethylene oxide, whereas 0.5% solution occasionally failed. Spores of an old culture of *Clostridium tetani* also were killed. Investigation with a sample of fresh vaccinia virus calf lymph in 10% dilution of rabbit serum also showed that a portion treated with ethylene oxide was completely non-infective. The authors state that although the chemical activity of the substance is high, it did not alter the growth capacity of a medium after the lapse of time sufficient for the

medium to have recovered its growth capacity. When the substance had been freshly added to medium it was toxic for mice, but the toxicity had disappeared in the time necessary to restore the nutrient capacity of the medium. The authors believe that the method has a place in bacteriological techniques, and are using it in routine examinations employing milk.

### HYGIENE.

#### Periodic Examination in the Prevention of Coalworkers' Pneumonokoniosis.

A. COCHRANE, C. FLETCHER, J. GILSON AND P. HUGH-JONES (*The British Journal of Industrial Medicine*, April, 1951) state that they have collected evidence from their experience with coalworkers' pneumonokoniosis among Welsh coalminers to show the value of periodic medical examinations in the prevention of coalworkers' pneumonokoniosis. Two conditions which follow inhalation of sufficient coal dust are simple coalworkers' pneumonokoniosis and progressive massive fibrosis. These are described and discussed, and evidence is produced in support of the following statements: (i) if a man is removed from further exposure to dangerous dust when he has only a small amount of simple pneumonokoniosis, he is most unlikely to develop progressive massive fibrosis; (ii) once a man has enough simple pneumonokoniosis, progressive massive fibrosis may develop with equal likelihood whether or not dust exposure ceases; (iii) once massive fibrosis has started it is nearly always progressive, though at widely varying rates. The authors state that if men are prevented from developing more than early simple pneumonokoniosis it is known that they will not develop progressive massive fibrosis with its attendant disability. They consider that as the early stages of simple pneumonokoniosis are asymptomatic and can be detected only by X-ray examination, a system of periodic X-ray examinations would ensure the prevention of disabling pneumonokoniosis. Evidence is presented to show that early radiological changes can be detected before serious disablement occurs, and that if the men with these early changes are removed from exposure to dangerous dust they will then not develop the progressive massive fibrosis which is the cause of serious disability. Practical details are discussed, such as the advice to be given after the examination, the separation of the scheme from problems of compensation, the interval between X-ray examinations, and the effect on manpower. The authors conclude that the periodic examination would provide a means of defining safe dust levels in different mines leading to control of the disease by economical dust suppression, meanwhile giving protection to new entrants and to workers not already affected.

#### Pollomyelitis and Public Water Supplies.

E. MACKENZIE (*Public Health*, December, 1950), in a report to the London Metropolitan Water Board, discusses the possibility of water transmission of pollomyelitis. He states that the

virus of pollomyelitis is present in the faeces of an infected person and that it has been shown that it can survive and retain its virulence in sewage and water for three months or longer. He discusses the epidemiology and states that the claims that the virus is capable of existing for long periods outside the human body—the natural habitat of the virus—have necessitated a reconsideration of the possible routes by which it may be spread. It has recently been suggested that it may be spread by infected dust. Other excremental diseases are spread by foodstuffs, milk, flies and water. There is evidence that similar agencies may be responsible for the spread of pollomyelitis. It is, however, concluded that there is no evidence that the virus of pollomyelitis has ever been distributed in a public water supply in sufficient quantity to cause infection, or that it is capable of surviving in quantity the purification processes of the Metropolitan Water Board. In the area supplied, pollomyelitis has never occurred as an explosive outbreak typically associated with water supply dissemination of the causative organism. Water supplied from rivers and wells in the area under discussion is superchlorinated to give a residual free chlorine content of more than the 0.05 part considered necessary to inactivate the virus.

#### DDT Dusting Operations and Murine Typhus Control.

E. HILL, H. MORLAN, B. UTTERBACK AND J. SCHUBERT (*American Journal of Public Health and The Nation's Health*, April, 1951) record the results obtained by the county-wide dusting of rat runs and rat harbourages with DDT for murine typhus control. A powder containing pyrophyllite and 10% of DDT was distributed in such a manner that rats traversing customary paths from harbourage to food and water passed through patches of the powder. The authors state that the incidence of human cases of murine typhus fever, prevalence of complement-fixing antibodies in the domestic rat reservoir and the abundance of rat fleas were significantly reduced. These suppressions of human incidence, reservoir prevalence and vector abundance have persisted for over two years since the last county-wide treatment of two counties in southern Georgia, United States of America. As a whole, no significant change in the three epidemiological factors mentioned was noted in the untreated county. A clean-up drive in the county seat of the untreated county did produce a significant reduction in human incidence in that one town during 1947. A moderate rise in prevalence of murine typhus complement-fixing antibodies in the domestic rat reservoir in the two treated counties in 1949 accompanied by a moderate increase in abundance of rat fleas suggests the necessity for further surveillance.

#### Evaluation of Trichloroethylene Exposure.

A. AHLMARK AND S. FORSSMAN (*Archives of Industrial Hygiene and Occupational Medicine*, April, 1951) have investigated the effect of trichloroethylene on workers in factories where it is used as a solvent. They state that when inhaled, trichloroethylene is partly oxidized in the body to trichloroacetic acid, which is excreted in the

urine. They studied the effect of trichloroethylene on 122 workers and found that the urinary concentration of trichloroacetic acid could be used as an indication of the degree of trichloroethylene exposure. It was found that exposure entailing acid excretion of less than 20 milligrammes per litre of urine probably gives rise to definite effects only in exceptional cases. Effects occur in about half of the persons excreting 40 to 75 milligrammes per litre and in almost all those excreting 100 milligrammes or more. With an exposure constantly entailing excretion of 200 milligrammes of trichloroacetic acid or more per litre of urine the symptoms are often so pronounced that sick leave is requested. It was not possible to show any connexion between the ages of the exposed workers and the effects of trichloroethylene; nor were women more liable to be affected than men. A constant trichloroethylene exposure which gives rise to an excretion of up to 20 milligrammes of trichloroacetic acid per litre of urine is regarded as tolerable from the point of view of hygiene. The authors found that it was possible in practice to reduce the trichloroethylene exposure to this limit, even in industries in which trichloroethylene was used in large quantities under difficult working conditions.

#### Epidemiological Approaches to Heart Disease.

T. R. DAWBER, G. MEADORS AND F. MOORE (*American Journal of Public Health and The Nation's Health*, March, 1951) have commenced an investigation into the epidemiology of heart disease. They state that epidemiology, from their point of view, deals with the fundamental questions of where a given disease is found, when it thrives, and where and when it is not found, without regard to whether the disease is believed to be infectious. Arteriosclerotic and hypertensive cardiovascular disease will be studied. Framingham, an industrial and trading centre with a population of 28,000 people, has been chosen for the investigation. A group will be selected of about 6000 persons in the age group in which arteriosclerotic and hypertensive cardiovascular disease is known to develop. Those in this group who have been found to be free of cardiovascular disease by a complete clinical examination will be observed for a period of approximately twenty years. The factors influencing the development of disease in any person in this group will be investigated. The investigation will include an extensive medical history and a careful physical examination of each person aimed at detecting cardiovascular abnormalities or diseases related to the cardiovascular system. The authors state that from the initial examinations, the prevalence of disease can be determined. As the investigation proceeds, the value of diagnostic aids such as miniature chest X-ray films and electrocardiograms will become evident. Factors associated with the development of disease can be studied, and the progress of disease over a number of years can be investigated. At the completion of the investigation there will be data which will yield estimates of incidence of arteriosclerotic and hypertensive cardiovascular disease for a more representative population group than has hitherto been studied.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, on August 30, 1951, Dr. K. C. T. RAWLE, the President, in the chair.

#### Rheumatoid Arthritis.

DR. SELWYN G. NELSON read a paper entitled "Rheumatoid Arthritis" (see page 581).

DR. G. S. COLVIN read a paper entitled "Rheumatoid Arthritis" (see page 585).

DR. L. J. PARR congratulated both speakers on their papers and remarked that it was pleasing to observe a liaison between the physician and the orthopaedist. He said that in America the tendency was to have an expert in physical medicine as well in the arthritis clinic. He went on to say that rheumatoid arthritis had a large number of variants and that it was important to recognize these and especially to describe them accurately, because results of therapy could be compared only when forms of the disease were described. There was an atypical form of rheumatoid arthritis which began in the large joints and was asymmetrical, and over a period of three years three-quarters of such cases would be transformed into the classical form of the disease, the picture of bilateral, symmetrical small joint involvement. The form mostly described by the speakers was the vasospastic variety of typical rheumatoid arthritis, in which there was the usual evidence of vasospasm with pink finger tips, distended venules, pallor of the anterior surfaces of the proximal and middle phalanges, and in some cases palmar erythema, the so-called liver palm, but there were other varieties, one of which was the low-grade periarticular form, often accompanied by a slightly raised or normal sedimentation rate with absence of osteoporosis for years; that was in contrast with the early loss of calcium seen in the vasospastic type of the disease. There was also a variant in which psoriasis was a factor, and that could be divided into two types: in one psoriasis waned during the summer and was aggravated during the winter, and in the other the reverse happened. There was another variant associated with a Raynaud-like syndrome, in which the diagnosis of Raynaud's disease might be made if the erythrocyte sedimentation rate was not examined. In yet another variant the synovial membrane was much involved; the synovial swellings were soft and puffy and could be observed to bulge out on either side of the extensor tendons over the interphalangeal joints. Those cases often went on for a large number of years and were associated with very little change or disability. Another type of case occurred associated with the so-called shoulder-hand syndrome, which occurred following coronary thrombosis or pulmonary embolism. Dr. Parr had seen a number of such cases finally terminate as typical rheumatoid arthritis with ulnar deviation. The patients rarely had a raised sedimentation rate. Palmar fibrosis commonly occurred in such a type and might lead to typical contracture. Endocrine abnormality might be associated with rheumatoid arthritis, and a low-grade periarticular variety of the disease was sometimes associated with subthyroidism and the vasospastic type with hyperthyroidism. Hypofunction of the suprarenal cortex might be associated with considerable muscular hypotonicity and a tendency to subluxation, whilst muscle spasticity might be associated with the vasospastic variant. Association of Addison's disease and rheumatoid arthritis was very uncommon, and if it did occur it was generally associated with a very high sedimentation rate. Dr. Parr remarked that there was no evidence of reduction of suprarenal cortical activity with regard to the glucocorticoids in rheumatoid arthritis, as histological findings on examination of suprarenal cortex were normal in that disease; the fasting blood sugar content was also normal or slightly raised, whilst the reaction to adrenaline or ACTH was normal in the great majority of cases. Dr. Parr said that the variants described represented a few of the types that had been seen over many years. Whether they had the same basic cause no one knew, but there might be a common denominator between them. Dr. Parr was using cortisone intraarticularly with some interesting results; the method might be of value when only one or two joints were involved.

Dr. Parr then showed photographs to illustrate some variants of the disease, and also one case in which a complete remission of the disease had taken place, the cause

of which was unknown. He remarked that in his experience he had seen only two cases of spontaneous remission in which the patients had remained completely symptomless over years. Dr. Parr discussed what should be the salient diagnostic points of a remission, as compared with what was sometimes called a remission obtained by gold, sulphoamides or cortisone, in which the disease's activity was still maintained but was merely a smouldering fire. He also showed a photograph of a female patient, in whom the disease was of sixteen years' duration, but following administration of aceto-sulphone ("Promacetin"), a remedy being used for leprosy, complete remission of the disease occurred.

DR. T. W. BURGESS said that he was disappointed that Dr. Nelson had not found time to say more on the subject of diagnosis. He asked Dr. Nelson to tell the meeting something about differential diagnosis between gout and rheumatoid arthritis. It was well known that gout could simulate the rheumatoid condition.

DR. N. H. MORGAN said that he wished Dr. Nelson would discuss the subject of septic foci. In earlier years patients with rheumatoid conditions had all been sent either to the dentist to have teeth removed because of dental sepsis, or to the rhinologist to have tonsils removed because of tonsillar infection. It was common experience that the administration of ACTH sometimes had an effect similar to that produced by operation for removal of a septic focus. Sometimes sham operations had the same effect. He wondered whether the effect of vicious surgery was not the same sometimes as the removal of a septic focus. There was no doubt that septic foci were responsible for some cases of infective arthritis. It was sometimes found that if penicillin was given after the removal of septic tonsils or teeth, recovery would occur. Dr. Morgan referred to the shoulder-hand syndrome and to the periartthritis associated with it. He said that if manipulation was carried out too early, a swollen hand resulted. But the same swollen hand might result if no manipulation at all was done. In conclusion, Dr. Morgan referred to a case which appeared to be frank rheumatoid arthritis, but in which blood was present in the faeces. Sigmoidoscopic examination was carried out and Crohn's disease was diagnosed. A short-circuiting operation was carried out and the patient was now well.

DR. W. J. HULL asked Dr. Nelson to describe the type of rheumatoid arthritis in which gold therapy should be used. He also asked Dr. Colvin whether he could indicate the right time for manipulation—how it could be determined. Dr. Hull was concerned with the differentiation between multiple infective arthritis and rheumatoid arthritis. That was sometimes difficult. He wondered whether there was an infective factor in the aetiology of rheumatoid arthritis.

DR. L. J. WOODLAND said that he was interested in Dr. Morgan's remarks about the effect of operation and trauma. He referred to a patient who had been acutely ill for some years and who had many joints affected. Both hips were ankylosed, and Dr. Woodland had been persuaded to perform a cup arthroplasty on one hip joint. A considerable general improvement had followed this procedure and every affected joint improved. The least improvement occurred in the hip joint which had been operated on. Dr. Woodland did not think that cup arthroplasty was suitable for rheumatoid arthritis in general, but that it was far more applicable in osteoarthritis. Dr. Woodland referred to the effect of cortisone when it was used after arthroplasty. He said that a period of quiescence occurred, in which it was possible to move joints and to promote rehabilitation of the patient. In those circumstances it was possible that the application of cup arthroplasty to hips might come back into favour. Dr. Woodland referred to the treatment of affected knees and feet. In regard to the former he said that it was necessary to prevent flexion deformity and to treat it when it had arisen. The deformity was best treated by pin traction through the upper end of the tibia in the Hamilton Russell method. When that method was used the pin should be inserted well back in the bone, and a traction weight of about five to fifteen pounds should be applied for, say, two weeks. A general anaesthetic was then given, the joint investigated and an appraisal made. Subsequent treatment depended on whether or not the patella was mobile, the tibia had not subluxated backwards and the knee could be gently manipulated into full extension. Discussing the prevention of deformity, Dr. Woodland said that orthopaedic surgeons had not been "let in" on that aspect. They were asked to correct deformities when they had arisen. They would like to take part in prevention. In regard to movement, Dr. Woodland declared that active movement only was of use. At the present time with use of cortisone, joints often became lax. Care was necessary in manipulation under anaesthesia, as subluxations occurred readily. The laxity did not last. It was important while the patient was

under the influence of cortisone to encourage exercise. Dr. Woodland concluded by saying that the exhibition of cortisone would be useful in connexion with mobilizing operations.

Dr. W. J. McCristal said that whilst it was right that the limitations of ACTH and cortisone should be indicated, it was just as vital that attention should be drawn to their great potentialities for the better understanding of the diagnosis and treatment of disease. It was to be hoped that those interesting physiological tools would soon be available in adequate amounts for Australian medical research. Since some authorities seemed to regard the sheep cell agglutination test as almost specific for rheumatoid arthritis, he asked Dr. Nelson if he would kindly give him any information on that point.

Dr. Nelson, in reply to Dr. Burgess, said that the differential diagnosis of rheumatoid arthritis varied from case to case. Sometimes the diagnosis was obvious. Two examples of difficult diagnosis were referred to. In one instance the skiagram of the hand might show areas of erosion which simulated the appearance of gout. The blood uric acid level in some cases of gout might be normal, so that a therapeutic trial of colchicine might be necessary before it could be finally decided whether the patient had gout or rheumatoid arthritis. The other instance was the diagnosis of rheumatoid arthritis in the presence of Heberden's nodes, which occurred in osteoarthritis. The additional presence of rheumatoid arthritis would be indicated by the involvement of the metacarpophalangeal joints, which did not occur in osteoarthritis. In reply to Dr. Morgan on the question of septic foci, Dr. Nelson said that in general the type of case which he had been discussing was what Dr. Parr referred to as the vasospastic type. In cases of this type no benefit as a rule resulted from the removal of septic foci. The indication for removal was the effect they had on the patient's general health, apart altogether from the joint disease. Cases were seen in which a difference was produced by removal of septic foci, but these probably were not cases of true rheumatoid arthritis. In these circumstances the condition was a toxic allergic process in the periarticular structures. Intermittent swelling might be the result of a septic focus, and in those circumstances administration of the sulphonamides might be useful. Dr. Morgan mentioned the results produced by the administration of ACTH and their similarity to results sometimes achieved by sham operations. In those circumstances the effect was only transitory. Dr. Nelson agreed with what Dr. Morgan had said about the shoulder-hand syndrome.

In reply to Dr. Hull, Dr. Nelson said that gold should be given when the rheumatoid arthritis was active and no contraindications were present—in other words when the renal efficiency *et cetera* were normal. Gold produced better results in the less severe than in the very severe cases.

In reply to Dr. McCristal, Dr. Nelson said that he had had no experience of the Rose test with sheep cell antigen. Dr. Nelson also referred to the antistreptolysin titre and the occurrence of rheumatoid arthritis, and said that the facts suggested that there might be an infective basis for rheumatoid arthritis, but if there were such a basis it was not the sole cause. The susceptibilities in the disease were individual.

In reply to Dr. Parr, who had discussed different types of rheumatoid arthritis, Dr. Nelson said that he agreed with Dr. Parr that they had been discussing the classical type of the condition. Some of the conditions mentioned by Dr. Parr would not be included by Dr. Nelson under the heading of rheumatoid arthritis. He would put them into a different category. The whole thing was a matter of classification. In conclusion, Dr. Nelson referred to a statement by Albright in Cecil's text-book of medicine to the effect that endocrinology and internal medicine were one and indivisible. Dr. Nelson held that rheumatoid arthritis and internal medicine were also one and indivisible.

Dr. Colvin, in his reply to Dr. Hull, said that prior to the advent of cortisone, manipulation of the joints was not undertaken until acute manifestations had subsided. Active movement of the joint was all-important; passive movement by the physiotherapist was less effective. In regard to movements carried out on the anesthetized patient, they were similar in effect though of greater magnitude than would be passive stretching by the physiotherapist. If these movements were carried out before subsidence of the acute stage, the ultimate range of movement would probably not be increased, but pain would be. Dr. Colvin thought that with the use of cortisone it might be possible to obtain movement at an earlier stage. In the case of contracture of the knee joint, even after suitable preparation, passive movement should not be undertaken except with the greatest care.

Dr. Colvin referred to Dr. Woodland's mention of cup arthroplasty of the hip. He thought that the type of operation for ankylosed hips could be controversial. He had referred to bilateral ankylosed hips. If a patient was completely bed-ridden, owing to fixation of his hips, or had to spend his life sitting in a chair, then arthroplasty would have a place in treatment.

A MEETING of the Victorian Branch of the British Medical Association was held on June 20, 1951, at the Royal Melbourne Hospital. The meeting took the form of a number of clinical demonstrations by members of the honorary medical and surgical staff of the hospital.

#### Herpes Zoster with Other Skin Conditions.

Dr. I. O. STAHLE showed a male patient, aged sixty-eight years, an Australian born of Anglo-Saxon parents. Twelve days before the meeting the right side of his neck was somewhat stiff and painful; next day burning sensations were felt in the skin over the area, and blotchy red spots appeared. On the following day some spots became raised, and some festered; the burning was more severe, although neck pain and stiffness were less. He felt much off-colour, and had difficulty in maintaining his balance. He had a sleepless night, and formication and tingling were present in the affected areas. On June 12 he reported to the skin out-patient department, feeling slightly better. The area of the rash was still very irritable, with burning and hyperaesthesia; new blisters were appearing. Stiffness and tenderness of the deep neck muscles were present.

Examination of the patient revealed scattered groups of herpes zoster macules, papules, blisters and blotchy erythema over the scalp, the neck, and the acromial and clavicular areas on the right side corresponding to the distribution of the second, third and fourth cervical nerves. Superficial X-ray therapy was given to the clavicular area. Rest and sedation were instituted, and the application of perchloride of mercury (0.25%) in calamine lotion alternating with an antihistaminic cream was ordered.

Two days later, on June 14, a blister area, which had not been treated with X rays, became secondarily infected and burning was more severe. The stiffness had decreased. On June 16 secondary infection was absent and the blisters were drying. At the time of the meeting dried blister crusts were lifting off, leaving behind pinkish, atrophic macules, some of which would eventually show the permanent atrophy of zoster scars.

In discussing the management, Dr. Stahle said that X-ray therapy was given to an area because it was anticipated that the outbreak might become severe. The effect of X rays on the symptoms, and the extent of and the tendency to secondary infection of the treated area, were to be studied for statistical reasons. Superficial X-ray therapy was often of use in ameliorating symptoms and aborting early painful, severe blisters in severe cases. If the whole area had been irradiated in the case under discussion, it would have been difficult to assess the result of X-ray therapy, because natural improvement began on the day of therapy. There was no secondary infection in the irradiated area. In discussing the use of antibiotics, Dr. Stahle said that many were effective in controlling secondary infection and the burning sensation caused thereby. Almost every year in the last decade new treatments had been enthusiastically acclaimed, but had not stood investigation. That would always be so with diseases of a capricious nature. Members of the clinic in future would statistically test any new antibiotics which manufacturers stated to possess viricidal qualities. The patient shown had herpes zoster of more than average intensity, and presented a good example of the natural history of the disorder. Dr. Stahle said that it was advisable to confine troublesome patients to bed, but inadvisable to speak of the possibility of post-herpetic neuralgia in front of them. Only sometimes were antihistaminic creams more effective than the time-honoured calamine preparations. Members of the clinic were interested in assessing the therapeutic effectiveness of certain vitamin and liver injections, but conclusions were not yet forthcoming.

Dr. Stahle went on to say that the patient under discussion was being shown also so that the treatment of more common and persistent complaints could be discussed. He had numerous keratoses on the atrophic skin of the dorsum of both hands and wrists and of the scalp. The dorsum of the hands had recently recovered from contact dermatitis due to paint and turpentine. The patient had always been

a painter, but with increasing age his skin resistance to irritants had become reduced. Psoriasis was present on the chest and knees, and seborrhoeic warts flourished in profusion on his back. He had also suffered from factitious urticaria<sup>1</sup> on the trunk, which was probably related to the generalized upset caused by the zoster infection. Dr. Stahle advocated surgical removal for the keratoses, and said that the simplest means of treating seborrhoeic warts was to paint them once a week with liquid phenol and cover them with "Elastoplast". The psoriasis was localized and caused no distress to the patient. It was therefore considered that intensive ultra-violet light therapy associated with tar painting was better reserved for widespread and worrying lesions.

#### Lichen Planus.

Dr. Stahle next showed a healthy male patient, aged thirty years, suffering from an acute attack of *lichen planus*. Typical pinkish, flat-topped polygonal papules were present. Dr. Stahle said that *lichen planus*, like guttate psoriasis and scabies, was commonly found on the shaft and glans of the penis. Milky and bluish-white papules, plaques and transverse striations were also present on the buccal mucous membrane. The eruptions in the mouth might last for months or for several years, and in many cases the condition was diagnosed as leucoplakia, especially when the skin rash had faded, or the outbreak had been confined entirely to the mouth or, as sometimes happened, to the vulva or the vaginal mucous membrane. Dr. Stahle stressed the importance of a punch biopsy when there was doubt about the presence of leucoplakia, and said that that simple procedure would also differentiate *lichen planus* from *lichen sclerosus et atrophicus*, which he believed was an entirely different entity and not premalignant. The term leucoplakia simply meant "white patches on mucous surfaces", and apart from the two conditions which he had just mentioned, a similar clinical picture could be presented by *lupus erythematosus* with or without an associated skin eruption. The premalignant condition equivalent and histologically similar to senile keratosis on mucous membrane was rare compared with other conditions. Premalignant leucoplakia should be diagnosed only after a full examination of the skin and a histological investigation of the lesion.

#### Guttate Psoriasis, Chronic Folliculitis of the Neck and Cutaneous Remnant.

Dr. N. J. WILKINS showed a male patient, aged fifty years, a wood machinist, suffering from widespread guttate psoriasis, chronic folliculitis of the neck and a cutaneous remnant in the supraclavicular notch.

The first attack of psoriasis had occurred twenty-five years earlier, with the appearance of a generalized eruption on the trunk, extremities and face, which cleared in two or three months. Since then occasional transient lesions had appeared on the forearms and shins until two months prior to the meeting, when the second generalized attack had occurred. Investigation of the history showed that long remissions could occur in psoriasis of that type, and that, apart from the usual local measures employed in treatment, precipitating factors such as local infection should be considered. In the patient being presented, severe oral sepsis was evident.

Chronic folliculitis over the nape of the neck and in the occipital region had first appeared three years earlier, after a course of intramuscular penicillin therapy for a lacerated and infected hand. After the first outbreak the condition had been moderately active until eighteen months later, when it flared up after a further course of penicillin injections for cellulitis of the leg. Dr. Wilkins pointed out the typical indurated pustules, scarring, and small areas of alopecia.

Discussion failed to bring to light any experience of follicular eruptions of that type recurring after or aggravated by penicillin injections.

The cutaneous nodule had been present since the patient's birth, and was approximately one centimetre in diameter. This was regarded as a fibroma; on section it was found to have a channel lined by squamous epithelium, and the body of the tumour surrounding the sinus was composed of a spindle-cell type of connective tissue, whorled and laminated in some areas.

#### Pityriasis Rosea.

Dr. RALPH CLARKE showed a female patient, aged eighteen years, suffering from *pityriasis rosea*. The herald

<sup>1</sup> This has disappeared two weeks after the meeting.

patch was still visible on the neck, and had appeared seven days previously. The patient had suffered from mild malaise at the onset of the eruption. Oval, discoid, rose-red patches were present on the trunk; some had the typical collarette appearance with a frayed tissue-paper frill attached at the periphery. The rash was still developing on the chest and abdomen, and was beginning to display the typical arrangement of ovoid lesions with the long axis following the line of the ribs.

Dr. Clarke discussed the differential diagnosis from secondary syphilis, guttate psoriasis and seborrhoeic dermatitis. He said that symptomatic treatment with antipruritic lotions usually sufficed, but occasionally ultra-violet light was indicated for severe irritating eruptions. In answer to questions, Dr. Clarke said that three favourable characteristics of the condition were (i) that it was not contagious, (ii) that it did not recur, and (iii) that it was self-curative, the course being about five or six weeks. Sometimes the Wassermann test produced a positive reaction.

#### Lupus Erythematosus.

Dr. Clarke next showed a male patient, aged fifty years, with a history of annular lesions present on the face for four years. The lesions were red in colour and had whitish, atrophic centres. A clinical diagnosis of *lupus erythematosus* was confirmed by biopsy. "Mycerysin" injections had been given over a period of three months ending in June, 1950; the commencing dose was 0.01 gramme, which had been increased to 0.02 and then to 0.05 gramme. Since then two courses of "Bismol" injections had been given; the commencing dose was one millilitre, and that had been increased to two millilitres given at intervals of one week from December 5, 1950, to February 23, 1951. The lesions were fading and becoming flattened; some were pale, and other lesions were now represented by slight atrophy and pigmentation of the skin only.

Dr. Clarke said that adherent scale was no longer present to demonstrate the typical "carpet tack" appearance when the undersurface of lifted scale was inspected.

Dr. Clarke finally showed a married woman, aged thirty years, to illustrate the more rapid response of *lupus erythematosus* to treatment. For five years prior to attending the hospital in January, 1951, the patient had had an erythematous fixed eruption on the bat's wing area of her face and also on the upper limbs. The lesions were more widespread and erythematous than those of the previous patient, and somewhat more severe each summer. After one course of "Bismol" treatment all activity had ceased. Dr. Clarke pointed out the roughened, somewhat atrophic skin on the previously affected sites. The only sign of colour and plugging was towards the angle of the left eye.

Dr. Clarke stressed the fact that such a remarkable response to "Bismol" could not always be expected. In the great majority of cases protracted treatment was required, including well-controlled gold therapy. Iron and quinine medication at intervals between courses of treatment with heavy metals was also of use.

#### Eczema Reaction on Skin Graft.

Dr. W. LEMPRIERE showed a male patient, aged eighteen years, who had been severely injured in a street accident eleven years previously, most of the skin of his left leg having been destroyed. He had spent almost eight years in hospital undergoing progressive repair, including two full-thickness skin grafts covering the leg. The grafts had remained apparently healthy for two years, and then there developed on them moist scaly erythema, relieved only by bland local applications and aggravated by occlusive dressings. The circulation in the left foot was satisfactory, there was no cutaneous sensation in the grafted areas, and there was no evidence of scratching. In view of those findings Dr. Lempriere said that he could not agree with those who held that the site of the patient's eruption was determined by psychic factors. He thought that trophic factors were of importance in determining the site and extent of the lesion. He had exhibited the patient to show that a sensible patient was able to carry out his own dressings and continue with a sedentary job, provided that it was recognized that the eczema reaction must be treated gently. The problem of a further skin graft for a scarred area on the inner aspect of the knee had been deferred until the eczema reaction had cleared.

#### Acne Keloids.

Dr. Lempriere then showed a male patient, aged twenty-three years, a labourer, who had acne keloids on his chest.

He had had *acne vulgaris* since puberty. He was an amateur boxer and footballer. As a result of repeated trauma, a group of keloids formed over the upper portion of the sternum over a period of five years; they were painful and unsightly. Dr. Lempriere said that the patient was shown as presenting a problem in treatment. The merits of X-ray therapy, excision with or without X-ray therapy and occlusive dressings with Unna's paste were discussed. Occlusive treatment was favoured because the lesions were tender, and it was thought that observation of the keloids over a period of several months was necessary before a decision could be made whether keloids were still developing or were in fact spontaneously resolving.

### The Bilroth I Operation.

Dr. A. E. COATES showed patients to illustrate the use of the Bilroth I operation for certain gastric lesions.

The first patient was a male, aged forty-nine years, who gave a history of four years' intermittent melena. Two years previously a diagnosis of peptic ulcer had been made. On September 9, 1950, he was admitted to the Royal Melbourne Hospital with hæmatemesis; he was treated medically. On December 7 he had a coronary occlusion. On January 1, 1951, he had a further severe hæmatemesis, again treated medically. On April 12 he had a hæmatemesis and melena and epigastric pain. Examination of the stools revealed occult blood. Examination after a barium meal revealed a large ulcer on the lesser curvature of the stomach. At operation two ulcers were found, a small one near the pylorus, and a larger one penetrating the pancreas, and bleeding. There were large, firm glands along the lesser curvature and about the pylorus; the appearance suggested malignant change. A Bilroth I resection of the stomach was performed, seven-eighths of the stomach being removed, and convalescence was uneventful. The ulcer was benign.

The second patient was a male, aged thirty-seven years, who had a history of peptic ulcer of two years' duration. A gastroscopic examination was performed and a moderate-sized gastric ulcer was seen. Examination after a barium meal revealed a large gastric ulcer on the lesser curvature. He was treated by fluid given by the intragastric drip method, but his condition did not improve. The pain was severe, and vomiting was frequent. At operation on April 26, 1951, a Bilroth I resection of the stomach was performed. On April 30 he was taking a soft diet, and he was discharged from hospital on May 8. A Shoemaker modification of the Bilroth I operation was employed. At the time of the meeting his condition was much improved, but he still complained of some nausea.

Dr. Coates commented that examination after a barium meal in both cases revealed a small residual stomach with no obstruction at the gastro-duodenal anastomosis. Both the patients had had large gastric ulcers and were very ill, and a rapid removal of the lesion was indicated. The Bilroth I operation was suitable for such patients, and was free from complications which now and then followed the Polya type of anastomosis.

### Choleperitoneum and Subphrenic Abscess.

Dr. Coates then showed a male patient, aged fifty-one years, who had undergone a cholecystectomy by another surgeon in May, 1950. Choleperitoneum and subphrenic abscess followed. He was readmitted to hospital on January 27, 1951, suffering from jaundice, recurring fever (Charcot's intermittent type) and pain. The serum bilirubin content was 4.0 milligrammes per centum, the alkaline phosphatase content was 68 units, the Van den Bergh test produced a positive reaction, and the cephalin flocculation test produced a negative result.

On February 6 the abdomen was opened and the common bile duct explored. No common duct could be found above the first part of the duodenum except a small bulge at the *porta hepatis*. The duodenum was opened, and a sound was passed through the ampulla and upwards for three and a half inches, until it could be felt through a fibrous layer just above the first part of the duodenum. The end of the sound was cut upon a number 10 rubber catheter attached to it, and the sound was withdrawn into the duodenum together with the attached catheter. The duodenum was then mobilized by a lateral incision; the presumed distal part of the duct with the catheter was apposed to an opening made in the bulging proximal part of the duct at the *porta hepatis*. Four cotton sutures joined the hepatic end and the distal part of the duct, and the catheter

was allowed to lie in the proximal part of the duct, thus passing down into the duodenum. The latter was sutured with cotton to the undersurface of the liver. The duodenum was closed. The jaundice disappeared in a few days, but a small biliary fistula occurred after a week; it closed in fourteen days. The catheter remained in the common duct for three months, when X-ray examination showed that it had passed on. At the time of the meeting the patient was well and free from jaundice and all other symptoms, and was gaining in weight.

### Stricture of the Common Bile Duct.

Dr. Coates's next patient was a male, aged sixty-six years, who had undergone a cholecystostomy in 1923 for cholelithiasis. In 1937 cholecystectomy was performed. In 1949 he was admitted to the Royal Melbourne Hospital with jaundice; carcinoma of the head of the pancreas was diagnosed. The serum alkaline phosphatase content was 38 units at that time. He refused operation. On January 19, 1951, he was admitted to a medical ward suffering from obstructive jaundice; he was thin, greenish-yellow in colour, and a miserable specimen. The serum alkaline phosphatase content was 31 units, the cephalin flocculation test produced a "++" reaction, the serum protein content was 7.55 milligrammes per centum, the urinary diastase content was 200 units, and there was no excess of urobilinogen.

On March 11 the common bile duct was explored; no stones were found. A resilient stricture of the common bile duct was dilated with urethral sounds. No lesion was found in the pancreas except some thickening of the organ. A T tube of rubber was sutured into the common bile duct, and drainage had continued since. The stools were brown at times. Serial cholangiograms showed a regular constriction of the lower end of the common bile duct, but it was not progressive. Opaque oil flowed freely into the duodenum through the lower end of the common bile duct. On June 19 he was very well; the cephalin flocculation test produced a negative result, the alkaline phosphatase content was 30 units, and the urinary diastase content was 10 units; the Van den Bergh test produced a negative result and the Fouchet test also. Dr. Coates said that it was proposed to leave the T tube in position for one year.

### Prolonged Bile Drainage.

Dr. Coates next showed a female patient, aged seventy-five years, suffering from flatulent dyspepsia of fifty years' duration, jaundice eight months previously, and three weeks' severe jaundice recently. Cholecystostomy was performed and stones were removed from the common bile duct. T-tube drainage was established and the gall-bladder was removed. Prolonged external drainage (one month) was permitted by the T tube and the biliary fistula closed when the T tube was removed. Dr. Coates said that the patient was shown to illustrate the routine method of prolonged bile drainage in the treatment of sick patients.

### Pancreatic Cyst.

Dr. Coates finally showed a female patient, aged sixty-two years, suffering symptoms of diabetes, loss of weight, thirst and *pruritus vulvae*. The urine contained sugar and the blood sugar content was 0.4%. She was treated as a diabetic, and her condition was stabilized on 20 units of protamine zinc insulin a day. A mass was found in the upper part of the abdomen. A barium meal examination showed that the mass displaced the stomach forwards to the left. The diagnosis of pancreatic cyst was made.

At operation on February 13, 1951, the cyst, seven inches in diameter, was exposed, stomach and colon were wiped off it, and nineteen-twentieths of the cyst was removed. The remainder of the cyst, after it had been emptied, was adherent to the coeliac artery and the superior mesenteric artery. The residual piece of cyst wall was puckered around the end of a drain tube, which was brought out of the abdomen. The cyst fluid contained 100 units of diastase. The sinus had closed by June, 1951. The blood sugar level remained elevated and the patient still required 20 units of insulin per day. She was free from pain and discomfort in the abdomen. The pathological report on the cyst stated that the inner surface showed some calcification. On microscopic examination the cyst was found to be lined by a thick layer of hyaline connective tissue. The diagnosis was "pancreatic cyst".

(To be continued.)

## Out of the Past.

*In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.*

### SENTENCE OF A COURT-MARTIAL.<sup>1</sup> [Historical Records of Australia, May, 1805.]

The Sentence of the General Court-Martial held for the Trial of Mr. Mileham Assistant Surgeon viz:—The Court having maturely and deliberately considered the Evidence for & against the Prisoner, as well as what he had to offer in Defence, is of opinion that he is Guilty of the first Charge viz:—for disobedience of Orders in refusing to attend a patient in the General Hospital on the 13th of April 1805, do therefore sentence him to be publicly Reprimanded by the Commander-in-Chief. The Court is of Opinion that he is further guilty of the second Charge viz:—for Neglect of Duty in not attending a woman when in labour in the General Hospital on the 13th of April, 1805, do therefore sentence him to be publicly reprimanded by the Commander-in-Chief:—is fully approved and the Court-Martial dissolved. The Governor & Commander-in-Chief has to observe that the Proofs are so clear in substantiating Mr Mileham's disobedience of the Principal Surgeon's orders in a case where his Duty and Humanity equally required his prompt obedience that he entirely disapproves of Mr Mileham's want of a due subordination to the directions of his superior in the execution of his Duty. The Governor perfectly coincides with the Court-Martial in considering Mr Mileham Guilty of a neglect of Duty in not attending a Woman in Labour in the General Hospital from which conduct the Woman's Life and that of her offspring might have been endangered: and as Mr Mileham has recently endeavoured to evade his Duty when ordered, under false pretences, the Commander-in-Chief considers it necessary to inform that Officer that on his incurring any future Censure for neglect of Duty or Disobedience of Orders it will become necessary to suspend him from his situation as Assistant Surgeon till His Majesty's Commands are received thereon.

## Correspondence.

### THE PERINEAL DISSECTION IN EXCISION OF CARCINOMA OF THE RECTUM.

SIR: In his contribution in THE MEDICAL JOURNAL OF AUSTRALIA of October 13, 1951, Dr. E. S. R. Hughes has clearly described the essential steps in the perineal dissection for excision of the rectum, but he has raised several points that require comment.

If the coccyx is not removed it is more difficult to demonstrate the fascia of Waldeyer as such; but the supralelevator space may be approached laterally through the levator ani muscles, and the correct plane is then easily found. The retention of the coccyx is advisable, for it reduces the possibility of a perineal hernia. Also, it appears to decrease the incidence of delayed healing of the posterior portion of the wound of the perineum. Dr. Hughes is to be congratulated on having opened the rectum only once in a series of 70 cases. While not agreeing that the rectum is in danger of perforation posteriorly if the coccyx is left *in situ*, the possibility of opening into the rectum anteriorly must always be borne in mind when the tissue planes are obscured by inflammatory changes.

In his paper Dr. Hughes states that "in no case was injury caused to the urinary tract". Presumably, it is meant that the urinary tract was not injured intentionally. If a high resectability rate for carcinoma of the rectum has been attained, he would almost certainly have encountered one or more cases with extension into the bladder which also required partial cystectomy.

He has, however, minimized the fact that sometimes the recto-urethralis muscles are fused together, and their right and left halves do not separate readily on the passage of forceps. As has been shown by the surgeons at St. Mark's Hospital for Diseases of the Rectum, London, the dissection may then be facilitated by inserting a finger into

<sup>1</sup> From the original in the Mitchell Library, Sydney.

Denonvillier's space from either side and using it as a guide.

In some patients the whole of the lateral ligaments of the rectum may be hooked down with the finger and clamped; but, in others, such as an obese man with a narrow pelvis, this may not be possible.

In addition to the four sets of vessels which require ligation there are small veins around the base of the bladder which may have been injured. Attention to hemostasis in that area will greatly reduce the drainage from the cavity in the first few hours.

In spite of these comments I would like to support Dr. Hughes in his conclusion that the perineal dissection in excision of the rectum is not a difficult procedure given an intimate knowledge of the anatomy of the part *plus* some manual dexterity. Those surgeons who, as a routine, prefer the abdomino-perineal operation of Miles, and who carry out most of the dissection from above, are missing the interesting perineal dissection, while at the same time their patients would usually have benefited by a choice of some other procedure (Wilson, 1950).

Yours, etc.,

159 Macquarie Street,  
Sydney,  
October 19, 1951.

EDWARD WILSON.

### Reference.

Wilson, T. E. (1950), "The Place of Restorative Resections and Other Operations in the Treatment of Carcinoma of the Rectum", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, page 248.

### INFECTION IN NEWBORN BABIES.

SIR: When reading Dr. Clair Isbister's interesting and exhaustive account of her study of infections in the nursery, I noticed the frequency of cord infections. For the past six months I have applied a Howard Kelly clamp to the cord close to the skin of the baby's abdomen, as soon as the child is born. Six hours after the birth the cord stump is cut off on the distal side of the clamp, which is then removed. The umbilicus is left dry and clean. At first I left the clamp on for four hours only, but we had some oozing in one case, which, however, was easily controlled by applying a pair of artery forceps. There is no drying cord to be dressed, and no risk of a raw unhealthy stump. There has only been one instance of a small hernia amongst 30 cases, and this was in a premature baby.

Also for the past six months, following the Canadian custom, I have not allowed the babies to be bathed for ten days. The infants thus treated have not suffered from rashes or skin infections. The vernix is allowed to dry, and it gradually peels off. These two simple procedures have definitely reduced the incidence of sepsis in the nursery, and also have lightened the work of the nursing staff.

Yours, etc.,

137 Faulkner Street,  
Armidale,  
New South Wales.  
October 18, 1951.

E. KENT HUGHES.

### COMPLIMENTARY DINNER TO DR. NORMAN MCALISTER GREGG.

SIR: Many of your readers will be delighted to learn of the complimentary dinner to Dr. Norman McAlister Gregg.

It is strange that it was left to the Canadian Medical Association to be the first organization to honour him for his splendid work. Would it be possible at the Melbourne meeting of our own Medical Association in August to pay our tribute to him? It is given to few to discover a principle in pathology, and this is what his penetrating eyes have done. This principle has lain hidden until now, but from now on all branches of medicine will be influenced by his discovery. The significance of Dr. Gregg's work is appreciated more fully in Europe than here. Recognition by our Association and by the Federal Government would be fitting.

Yours, etc.,

108 Collins Street,  
Melbourne,  
October 18, 1951.

J. RINGLAND ANDERSON.

## Naval, Military and Air Force.

### APPOINTMENTS.

THE following appointments, promotions *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 78, of October 18, 1951.

#### AUSTRALIAN MILITARY FORCES.

##### Royal Australian Army Medical Corps (Medical).

NX700308 Captain H. Gayst is appointed from the Reserve of Officers, 9th August, 1951.

VX700198 Major R. B. Perrins is appointed from the Retired List, 3rd August, 1951.

VX700107 Captain (Temporary Major) G. W. Cooper relinquishes the temporary rank of Major and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District), 25th July, 1951.

VX14663 Major (Temporary Colonel) C. W. Nye, E.D. (Commanding Officer, British Commonwealth Occupation Force General Hospital, and Assistant Director of Medical Services, Headquarters, British Commonwealth Occupation Force), is appointed Deputy Director of Medical Services, Administrative Headquarters, British Commonwealth Forces in Korea, and to be Temporary Brigadier, 6th April, 1951.

##### Citizen Military Forces.

##### Eastern Command: Second Military District.

Royal Australian Army Medical Corps (Medical).—2/146527 Major J. F. C. Cobley is appointed to command 1st Field Ambulance and to be Lieutenant-Colonel, 1st July, 1951. 2/146504 Lieutenant-Colonel G. N. Young, E.D., relinquishes command 1st Field Ambulance, is appointed Assistant Director of Medical Services, Headquarters 2nd Division, and to be Temporary Colonel, 1st July, 1951. 2/50001 Colonel S. H. Lovell, E.D., relinquishes the appointment of Assistant Director of Medical Services, Headquarters 2nd Division, and is transferred to the Reserve of Officers (Royal Australian

Army Medical Corps (Medical)) (2nd Military District), 30th June, 1951. 2/127021 Honorary Captain J. G. Markus is appointed from the Reserve of Officers, and to be Captain (provisionally), 25th June, 1951. 2/146532 Captain G. Fitzgerald is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (2nd Military District), 3rd June, 1951.

##### Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—3/123415 Honorary Captain T. J. Walsh is appointed from the Reserve of Officers and to be Captain (provisionally), 24th July, 1951. 3/50056 Colonel J. G. G. White, O.B.E., E.D., from Deputy Director-General of Medical Services, A Branch, Army Headquarters, is appointed Deputy Director of Medical Services, Headquarters, Southern Command, 1st September, 1951. 3/50018 Colonel (Honorary Brigadier) H. G. Furnell, C.B.E., D.S.O., E.D., relinquishes the appointment of Deputy Director of Medical Services, Headquarters, Southern Command, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District), 31st August, 1951. 3/129123 Lieutenant-Colonel R. S. Smibert, O.B.E., is appointed Assistant Director of Medical Services, Headquarters 3rd Division, and to be Colonel, 1st October, 1951. 3/51002 Colonel W. W. Lempiere, D.S.O., E.D., relinquishes the appointment of Assistant Director of Medical Services, Headquarters 3rd Division, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District), 30th September, 1951. 3/101017 Captain B. H. Gandevia is appointed from the Reserve of Officers, 8th August, 1951.

##### Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical): To be Captain (Provisionally), 2nd August, 1951.—4/31918 Clive Stuart Kneebone.

##### Reserve Citizen Military Forces.

##### Royal Australian Army Medical Corps (Medical).

3rd Military District.—To be Honorary Captain, 14th August, 1951: David Alan Jolley. The resignation of Captain

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 6, 1951.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism .. ..	..	..	..	..	..	..	..	..	..
Amoebiasis .. ..	..	..	..	..	..	..	..	..	..
Ancylostomiasis .. ..	..	..	..	..	..	..	..	..	..
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Bilharziasis .. ..	..	..	..	..	..	..	..	..	..
Brucellosis .. ..	..	..	1	..	..	..	..	..	1
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	..	..	..	..	..	..	1	..	1
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) .. ..	..	..	19(16)	..	..	..	2	..	21
Diphtheria .. ..	8(2)	2(1)	..	..	3(2)	..	..	..	14
Dysentery (Bacillary) .. ..	..	..	3(3)	..	..	..	..	..	3
Encephalitis .. ..	..	..	..	..	..	..	..	..	..
Filariasis .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice .. ..	..	..	..	..	..	..	..	..	..
Hydatid .. ..	..	1	..	..	..	..	..	..	..
Infective Hepatitis .. ..	..	..	..	..	7(5)	..	2	..	9
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	1	..	..	..	..	..	1
Leptospirosis .. ..	..	..	..	..	..	..	..	..	..
Malaria .. ..	..	..	2(1)	..	..	..	..	..	2
Meningococcal Infection .. ..	3(2)	2(1)	..	..	..	..	..	..	5
Ophthalmia .. ..	..	..	..	..	..	..	..	..	..
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	..	..	..	..	..	..	..	..
Plague .. ..	..	..	..	..	..	..	..	..	..
Polioomyelitis .. ..	7(3)	7(1)	3(2)	44(20)	9(5)	..	..	..	70
Puerperal Fever .. ..	..	..	..	..	..	..	..	..	..
Rubella .. ..	..	15(14)	..	..	2(1)	..	..	3	20
Salmonella Infection .. ..	..	..	..	..	..	..	..	..	..
Scarlet Fever .. ..	14(11)	10(5)	1	5(5)	4(2)	3(2)	..	..	37
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	..	..	..	..	..	..	..	..
Trachoma .. ..	..	..	..	..	..	..	..	..	..
Trichinosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis .. ..	38(26)	22(5)	24(15)	7(6)	12(9)	6(2)	8	..	117
Typhoid Fever .. ..	..	..	..	..	1	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne) .. ..	..	..	..	1	..	..	..	..	1
Typhus (Louse-borne) .. ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.

E. H. S. Mancy of his commission is accepted, 5th July, 1951. To be Honorary Captain, 23rd August, 1951: Norman Stephen Price Wicks.

The following officers are placed upon the Retired List within Military Districts on the dates shown with honorary rank as indicated, and with permission to wear the prescribed uniform:

**2nd Military District: Honorary Colonels.**—Lieutenant-Colonels W. G. Masters, E.D., and E. M. Sheppard, E.D., 15th August, 1951.

The following officers are placed upon the Retired List within Military Districts and on the dates as shown, with permission to retain their rank and wear the prescribed uniform:

**2nd Military District.**—Lieutenant-Colonels T. C. Backhouse and T. Y. Nelson, Honorary Lieutenant-Colonel H. K. Ward, M.C., Majors E. M. Francis, D. J. Glissan, V. C. L. Hay, W. M. C. MacDonald and W. P. Wippell, Captain (Honorary Major) W. L. Calov, Captains B. J. Crowdy, D. Fowles, A. R. Hudson, E. A. Stobo, T. P. Tighe and G. H. Vernon, M.C., Honorary Captains C. H. Jaede, N. A. D. Keirle, K. F. Potts and D. G. R. Vickery, Lieutenants C. Tyson and W. T. Zouch, and Honorary Lieutenant A. J. Bearup, 15th August, 1951.

**3rd Military District.**—Honorary Captains T. W. George, W. E. Hewitt and A. F. MacInnes, 15th August, 1951.

#### ROYAL AUSTRALIAN AIR FORCE.

##### Permanent Air Force.

##### Medical Branch.

The probationary appointment of the following Flight Lieutenants is confirmed: J. F. Marrington (021966), D. B. Heylan (023063), K. M. Woods (023095).

##### Active Citizen Air Force.

##### Medical Branch.

Flight Lieutenant D. G. Howell (011967) is transferred to the Reserve, 8th August, 1951.—(Ex. Min. No. 57—Approved 15th October, 1951.)

## University Intelligence.

### UNIVERSITY OF MELBOURNE.

#### Elections to Council.

NOTICE is hereby given that the election of five members of the University Council, to hold office for a period of four years, will be held on Saturday, December 1, 1951, at 12 o'clock noon. The following nominations have been received: Dr. J. R. Darling, Mr. C. M. Gilray, Sir Russell Grimwade, Sir Charles Lowe, Mr. A. McDonnell, Sir John Newman Morris, Mrs. Ethel Southey. Any graduate of the university is entitled to vote and, on application to the returning officer, Mr. F. H. Johnston, to have sent to him the necessary voting papers. Any such application should be made not later than Saturday, November 24, 1951.

## Notice.

### COMPLIMENTARY DINNER TO DR. NORMAN MCALISTER GREGG.

As was announced in the issue of October 13, 1951, a representative committee of members of the medical profession (whose names were listed) is arranging a dinner to honour Dr. Norman McAlister Gregg and to commemorate suitably his highly significant and widely acclaimed clinical investigations. Other members of the medical profession are invited to join the committee in this.

The dinner will be held at the Royal Sydney Golf Club, Rose Bay, on Friday, December 7, 1951, at 6.30 p.m. The subscription will be three guineas. Dress will be dinner jacket. The function will mark the establishment of a medical prize and an award in association with the prize. A present appropriate to the occasion will be made to Dr. Gregg.

Those intending to be present are required to send their subscriptions to Dr. W. M. C. MacDonald, 139 Macquarie Street, Sydney, by November 23, 1951, but earlier communication would be preferable.

### THE ARTHUR WILSON MEMORIAL FUND.

THE following donations have been received for the Arthur Wilson Memorial Fund, which will be devoted to research into problems of childbirth, and are acknowledged with thanks. Donations may be sent to Dr. C. K. Churches, Honorary Treasurer, 122 Flinders Street, Melbourne, C.I., and will be acknowledged in this journal. Previously acknowledged £2249 7s., Mr. Robert Fowler £26 5s., Dr. L. E. Clay £5 5s., Dr. F. W. Grutzner £5 5s. Total £2286 2s.

## Diary for the Month.

- Nov. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- Nov. 7.—Western Australian Branch, B.M.A.: Council Meeting.
- Nov. 9.—Queensland Branch, B.M.A.: Council Meeting.
- Nov. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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**SUBSCRIPTION RATES.**—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £4 per annum within Australia and the British Commonwealth of Nations and £5 per annum within America and foreign countries, payable in advance.